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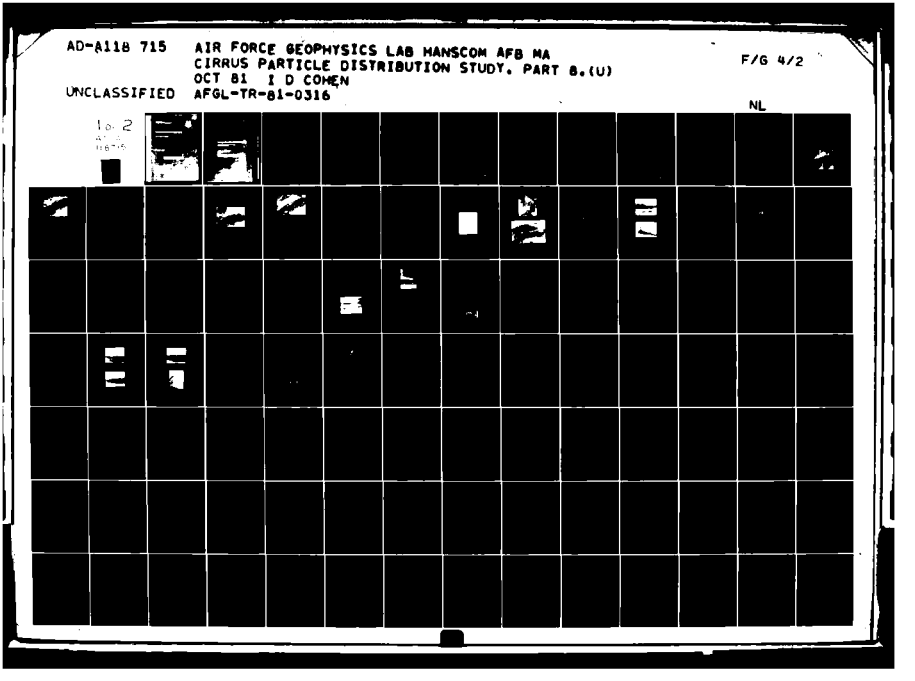

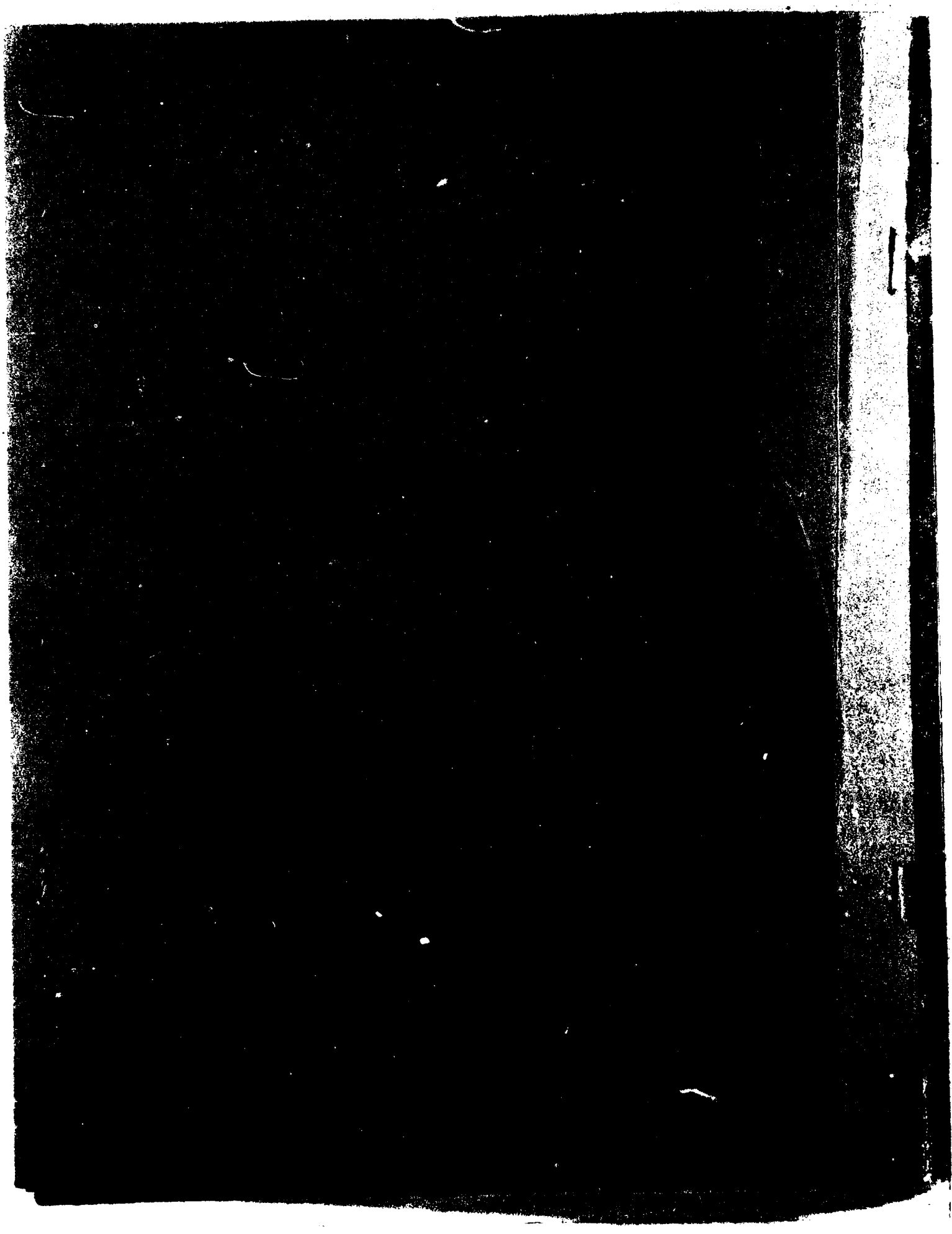

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The AFGL instrumented MC-130E sampled thin cirrus clouds on 3, 4, and 5 February 1979. In some cases, there was no visible cirrus, but some particles were detected. During this period, the upper air pattern was dominated by southwest to northeast flow, while two surface systems moved from north to south. The first of these left thin cirrus in eastern New Mexico; the second pushed south to the Gulf of Mexico, leaving the cirrus studied on the previous two flights. Most of the particles observed were less than 100 μm. As a rule, the opacity of the cirrus seemed related more closely to the density

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20. Abstract (Continued)

of particles in the 20⁻ to 200-μm range. On examination the form factor appeared to be higher (indicating more consistent sized particles) in cirrus of nonfrontal origin than in cirrus associated with strong surface weather systems. This report is the last in a series of cirrus particle distribution studies.

Preface

This report examines cloud physics data obtained on 3, 4, and 5 February 1979. The flights continue the sequence begun in the previous report in the series.

The author thanks the aircrew of the 4950th Test Wing and the AFGL project crew, consisting of Lt Col Donald J. Varley (Ret), MSgt James F. Bush (Ret), SSgt Dennis L. LaGross, SRA R. L. Ames, and SRA Grant Matsuoka, all of AFGL/LYC at the time of the flights. Dr. Arnold A. Barnes and Mr. Morton Glass reviewed the manuscript and provided many helpful suggestions. Mr. Jim Lally and Mr. Terrance O'Toole of Digital Programming Services, Inc., provided the printout. Finally, the author thanks Mrs. Patricia Sheehy for typing many versions of the manuscript.

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Illustrations

Cirrus Particle Distribution Study, Part 8

1. INTRODUCTION

This report, the last in a series, describes the flights made by MC-130E S/N 571 during 1978 and 1979 for investigation of tenuous clouds. The aircraft, operated and maintained by the 4950th Test Wing at Wright-Patterson AFB, Ohio, was equipped with cloud physics particle measuring instruments from the Cloud Physics Branch of the Meteorology Division of the Air Force Geophysics Laboratory (AFGL). The flights discussed in this report were conducted for the Air Force Weapons Laboratory (AFWL), in order to provide data on tenuous clouds for the Advanced Radiation Project.

Previous reports in this series have explored cirrus associated with upper level troughs,[1] frontal systems,[2-4] surface storms,[5] and nonfrontal cirrus.[6,7] The current report looks at three flights through weak frontal and nonfrontal cirrus of varying consistencies. In addition, two reports[8,9] explored the Marine Boundary Layer. Thus the series provides a look at a variety of tenuous clouds, both at high levels, and within one thousand feet of the Pacific Ocean.

Equipment on the MC-130E has been described by Varley.[1] The PMS 1-D and 2-D probes, together with other equipment, have been used throughout this program.

(Received for publication 28 October 1981)

Because of the large number of references cited above, they will not be listed here. See references, page 57.

The flights described here occurred on the three days after the last flight (2 February) discussed by Varley, Cohen, and Barnes,[5] continuing investigation of the type of thin cirrus frequently found over the United States during periods of fair weather. Further, this report will include a look at subvisible cirrus associated with this type of cloud. Barnes[10] and Ohtake et al,[11] among others, noted the existence of subvisible cirrus; Cohen and Barnes[4] noted its existence during previous flights in this series.

The flights of 3 and 4 February departed from and returned to Kirtland AFB, New Mexico. On 3 February, the aircraft examined cirrus associated with a dissipating polar frontal boundary in northeastern New Mexico. This boundary provided the cirrus sampled on 2 February and reported in Part 7 of this series.[5] On 4 February, the aircraft flew to southeastern New Mexico to sample cirrus formed ahead of an upper air trough. Sampling on 5 February was conducted during a flight from Kirtland AFB to Wright-Patterson AFB, Ohio. The aircraft flew through various types of cirrus resulting, at times, from the flow of air from the Gulf of Mexico above a shallow arctic air mass and, at other times, from upper air convergence.

A discussion of the weather on these three days follows. The data obtained from each flight will then be presented.

2. SYNOPTIC DISCUSSION OF CLOUD PHYSICS DATA 3,4, AND 5 FEBRUARY 1979

On the morning of 3 February, a continental polar high pressure area was centered in Nevada, and a weak ridge extended to a small high in Kansas. The southern boundary of this system was marked by a stationary front. By the time of the flight, this front was dissipating. Figure 1 shows the surface features at 1800Z on 3 February. The portion of the polar front from Arkansas to western Texas was not included on the National Weather Service analysis valid at 1800Z. However, it is included here in order to show the relationship of the dissipating front extending from New Mexico to Nevada and the active front which extended from a low in Ontario to Arkansas. Another outbreak of polar air was moving southward behind the front shown in South Dakota, Wyoming, and Montana. The

10. Barnes, A.A. (1980) Ice Particles in Clear Air, Communications a la VIII eme Conference sur la Physic Des Nuages, Vol I, Clermont-Ferrand, France, 15-19 July 1980, pp 189-190, AFGL-TR-81-0009, AD A094444.

11. Ohtake, T., Jaweera, K.O.L.F., and Sakurai, K. (1978) Formation Mechanism of Ice Crystals in Cloudless Atmosphere, Proceedings of Conference on Cloud Physics and Atmospheric Electricity, Issaquah, Washington, 31 July - 4 August 1978, pp 122-125.

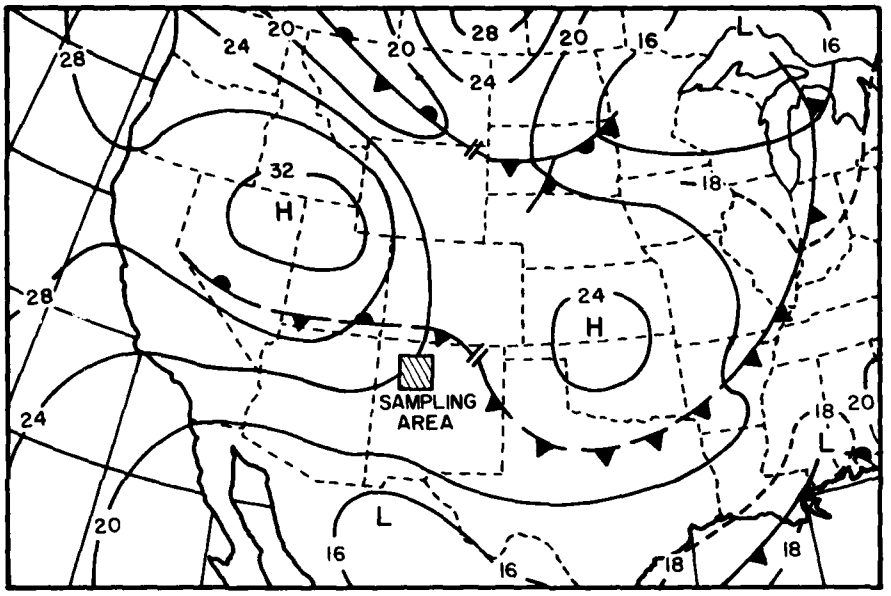


Figure 1. Surface Analysis 1800Z 3 February 1979

upper air pattern can be seen in Figure 2. The deep wave off the coast of Baja, California was to remain the dominant upper air feature throughout the period. A jet stream extended from El Paso, Texas to Little Rock, Arkansas, with maximum 500-mbar winds of 85 kt. As Figure 3 shows, much of the cloudiness in the area was found along the jet stream. Only a small amount of middle cloud remained along the dissipating surface frontal boundary in west Texas. The infrared photograph (Figure 4) shows even more dramatically how the higher clouds followed the jet stream. However, a small band of cirrus does branch off along the frontal boundary from Texas into northeastern New Mexico. This was the cirrus sampled by the flight of 3 February. A thin moist layer between 6 and 7 km on the Albuquerque sounding (Figure 5) and a thicker layer on the El Paso sounding (Figure 6) show the location of the cirrus layer. It was neither pure jet stream cirrus, nor purely frontal cirrus, but rather represented a combination of the two types of cloud. During the next 24 hours, the frontal boundary in west Texas continued to weaken and the previously mentioned front in South Dakota, Wyoming, and Montana became the dominant system. As Figure 7 shows, this front moved southeastward until by 2100Z it extended to Oklahoma, bringing with it a fresh outbreak of polar air. Comparison of Figures 8 and 9 with Figure 2 shows that the upper air pattern remained similar to that of 3 February. Although the jet stream had moved northward, the flow was still from the southwest to the northeast.

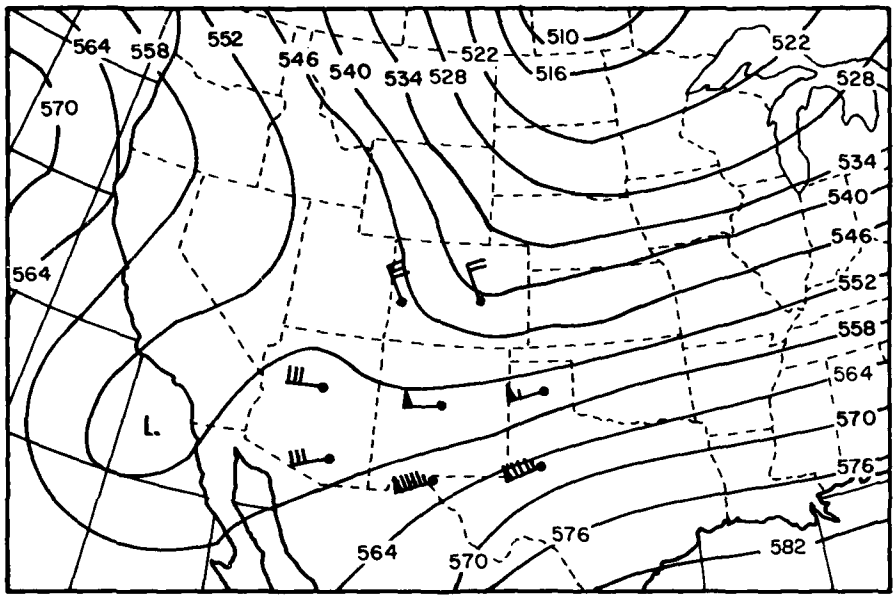


Figure 2. 500-Millibar Analysis 1200Z 3 February 1979

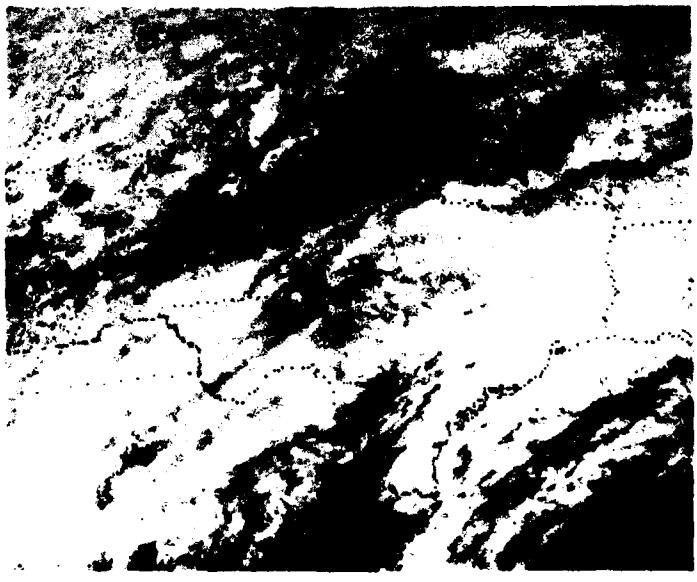


Figure 3. GOES East Visible Satellite Photo 1900Z 3 February 1979

Figure 4. GOES East Infrared Satellite Photo 1930Z 3 February 1979

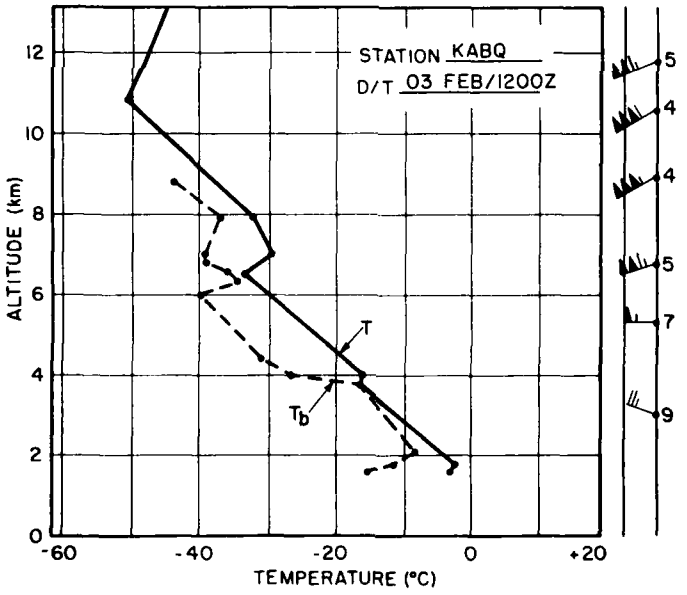


Figure 5. Albuquerque Sounding 1200Z 3 February 1979

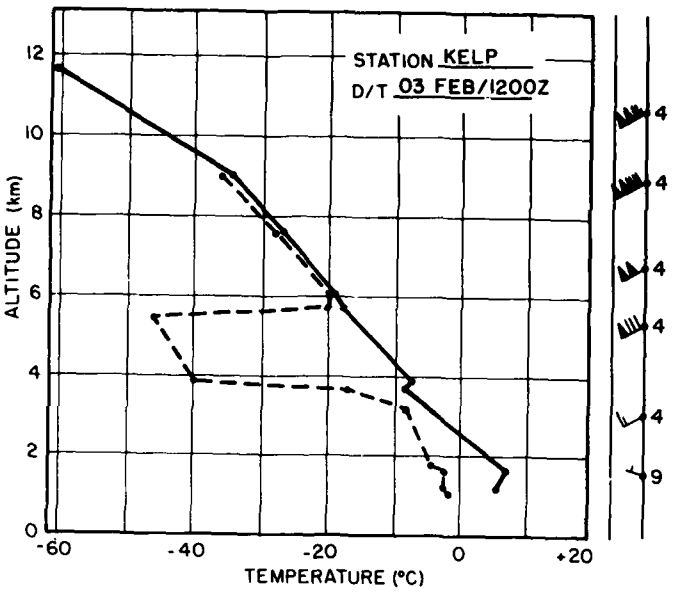


Figure 6. El Paso Sounding 1200Z 3 February 1979

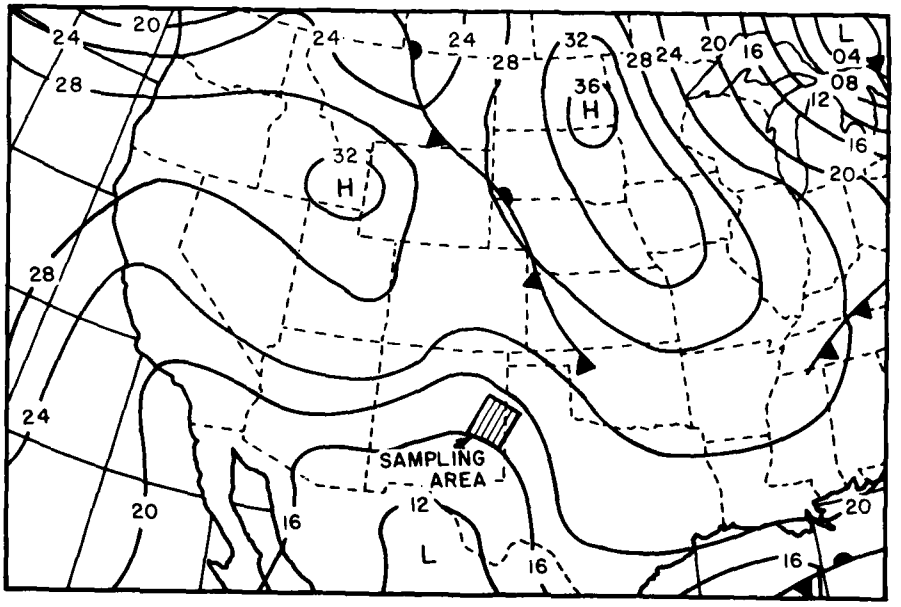


Figure 7. Surface Analysis 2100Z 4 February 1979

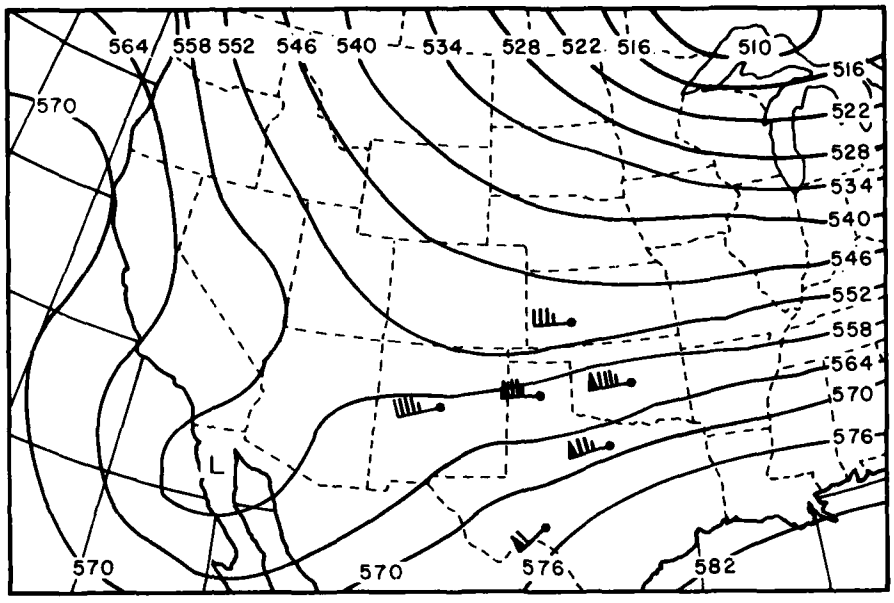


Figure 8. 500-Millibar Analysis 1200Z 4 February 1979

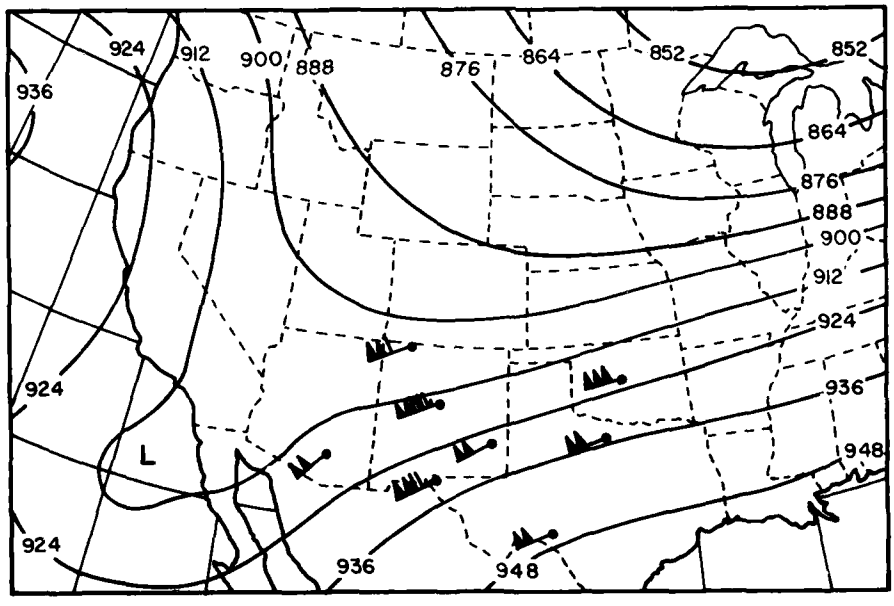


Figure 9. 300-Millibar Analysis 1200Z 4 February 1979

Extensive cloud cover existed along the jet stream from southeastern New Mexico to southern Missouri (Figure 10). However, no cirrus remained in northeastern New Mexico; therefore the aircraft flew in the cirrus band south of the jet stream. As the infrared photo in Figure 11 shows, this band of cirrus is clearly defined, and thus much more strongly associated with the jet stream than with the front. Only a few low clouds reveal the presence of the surface front (Figure 7) in western Kansas and Nebraska.

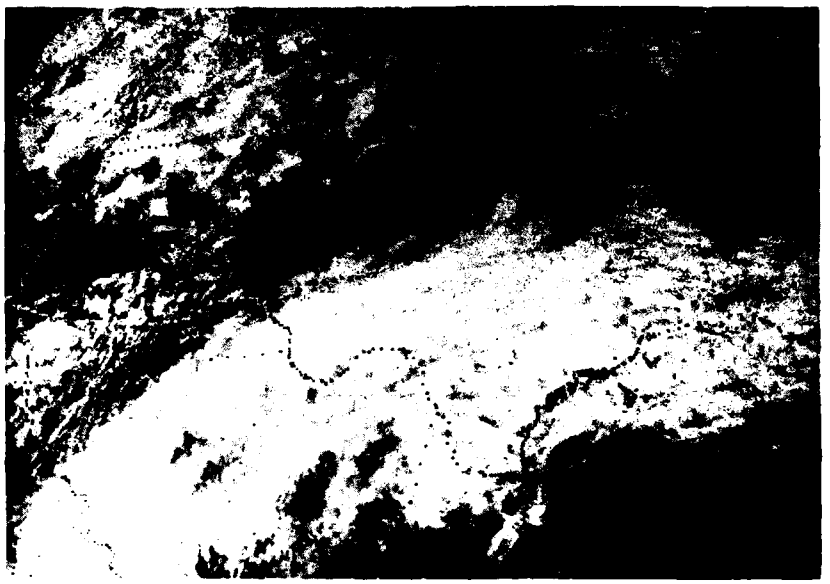


Figure 10. GOES East Visible Satellite Photo 2000Z 4 February 1979

The lack of wind shifts of over 20 degrees and the disappearance of the frontal inversion in the Albuquerque (Figure 12) and El Paso (Figure 13) soundings by 1200Z on 4 February indicate that the front had passed through the area. The polar high continued to push southward, and by 1800Z on 5 February, the polar air had moved south to the Gulf of Mexico. A weak boundary remained in western Kansas and Nebraska, but the main frontal activity was now in the Gulf of Mexico, as shown in Figure 14. Although the jet streams at 500 mbar and 300 mbar (Figures 15 and 16) were more diffuse, there was a strong flow from the west-southwest across the southern United States. The wave over the southwest had begun to weaken, but it still was a strong feature which influenced the circulation over the southwestern United States. The cloud pattern reflects the circulation

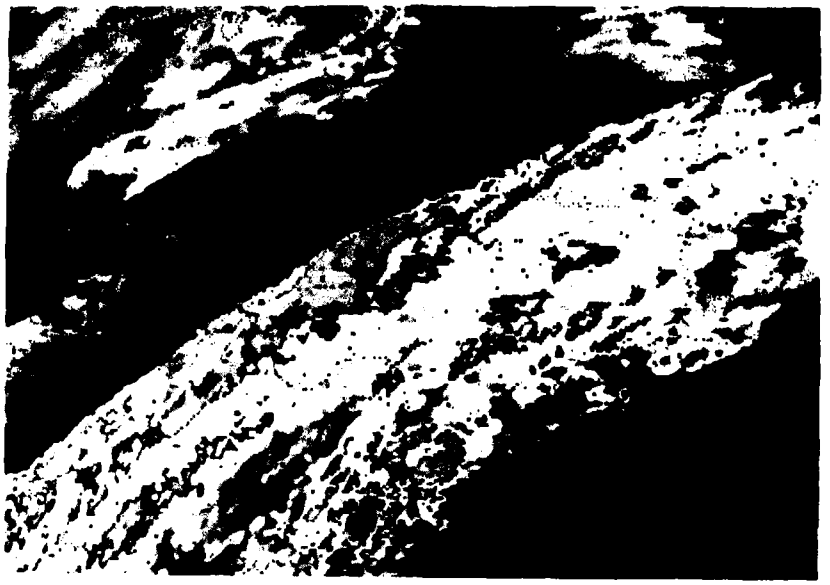


Figure 11. GOES East Infrared Satellite Photo 2030Z 4 February 1979

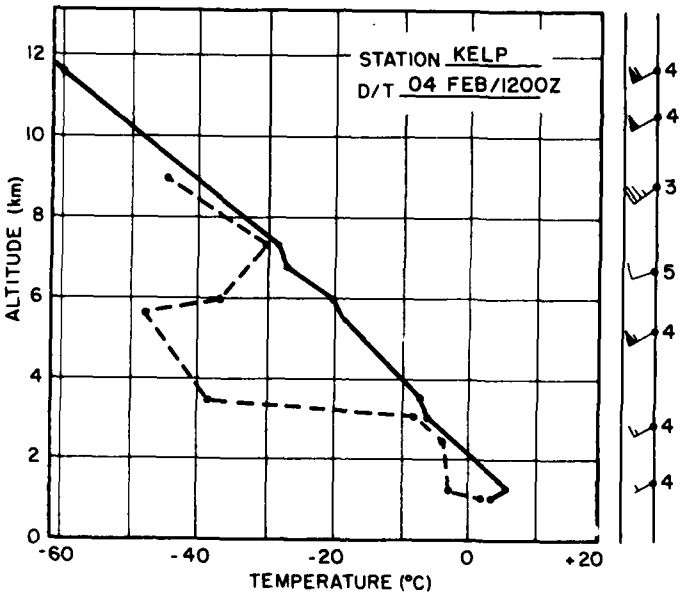


Figure 12. Albuquerque Sounding 1200Z 4 February 1979

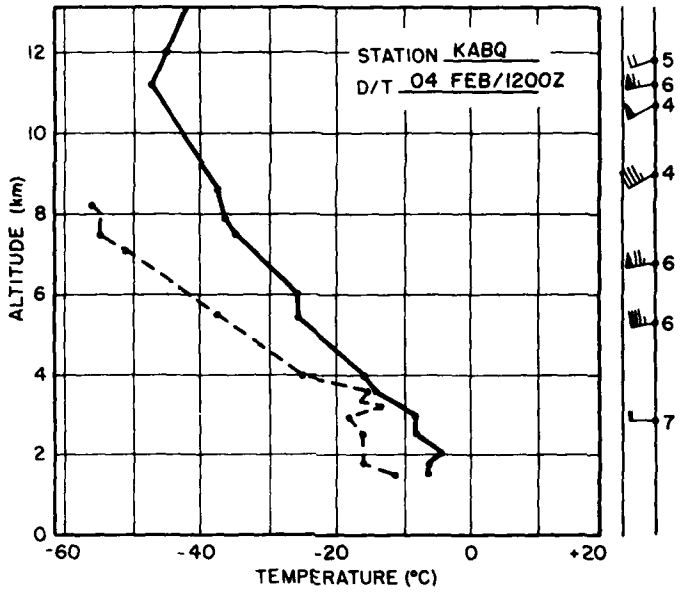


Figure 13. Fl Paso Sounding 1200Z 4 February 1979

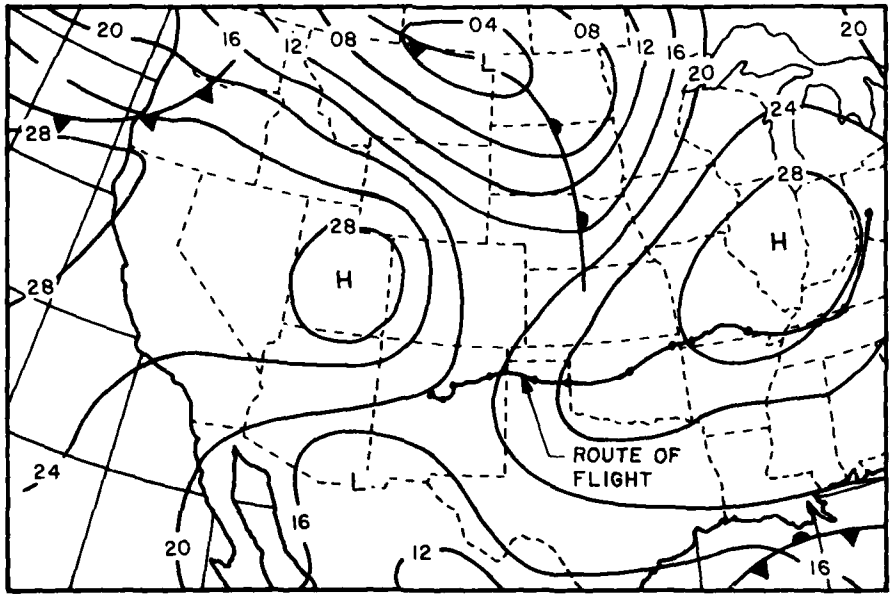


Figure 14. Surface Analysis 1800Z 5 February 1979

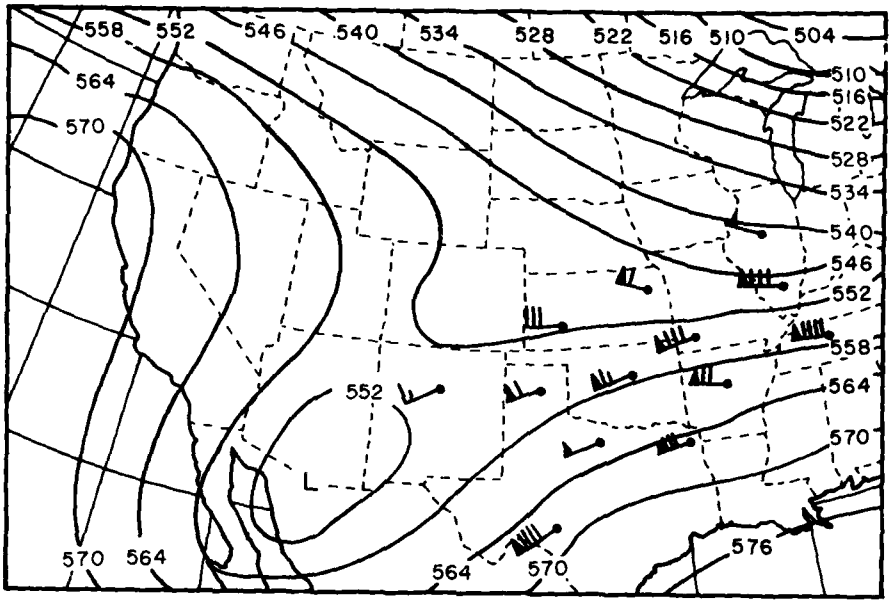


Figure 15. 500-Millibar Analysis 1200Z 5 February 1979

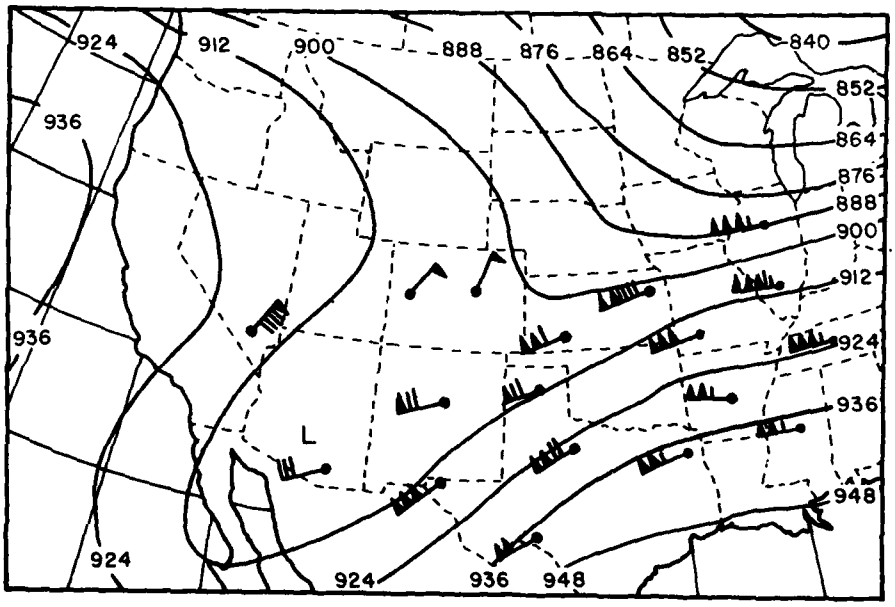


Figure 16. 300-Millibar Analysis 1200Z 5 February 1979

around this trough (Figure 17). The corresponding infrared photo (Figure 18) shows that the higher clouds were clearly influenced by this circulation. No GOES-East pictures were received, but a synchronous meteorological satellite (SMS-1) visible photo is presented in Figure 19. No rawindsonde data were available. The thick band of clouds in the southeastern United States was caused by overrunning of the warm front in the Gulf of Mexico; however, the strong winds aloft are reflected in the distinct northern edge of the cloud pattern. The path of the MC-130E during its flight on 5 February followed the northern edge of this cloud shield. Thus much of the cirrus sampled during this third and final flight represents the northern edge of the cloud shield caused by a stationary front. The aircraft flew from Kirtland AFB to Wright-Patterson AFB, following a route from Kirtland AFB to Oklahoma City, Oklahoma and Nashville, Tennessee, before proceeding to Wright-Patterson.

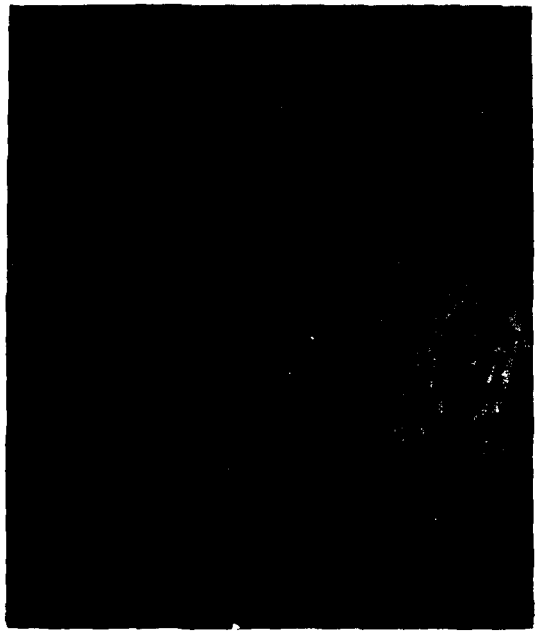


Figure 17. GOES West Visible Satellite Photo
1515Z 5 February 1979

Figure 18. GOES West Infrared Satellite Photo 1445Z 5 Februarv 1979

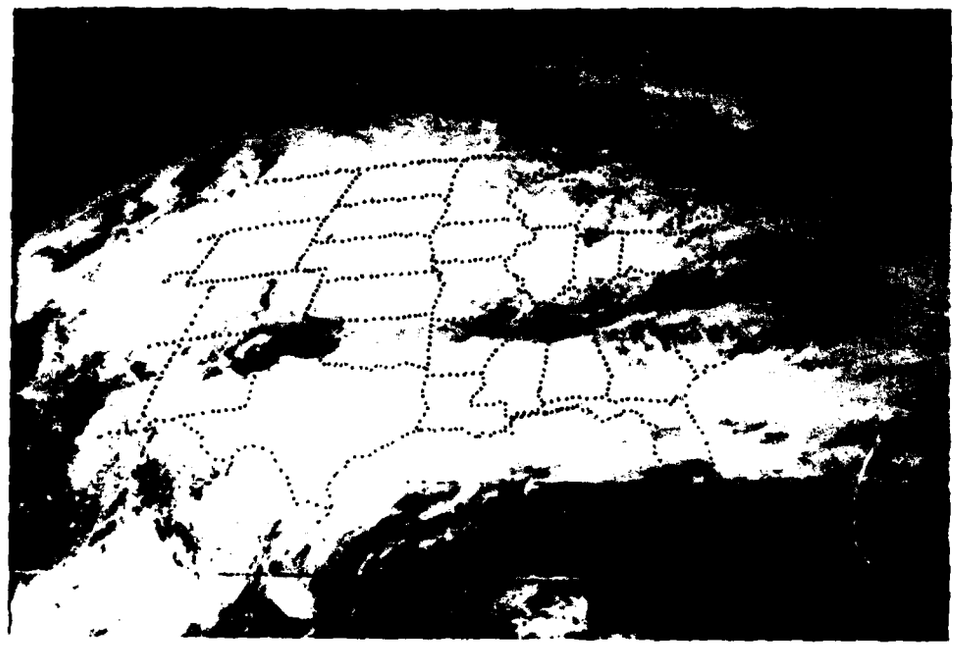


Figure 19. SMS-1 Satellite Photo 1930Z 5 February 1979

3. THE FLIGHT OF 3 FEBRUARY 1979

Leaving Kirtland AFB at 1804Z, the aircraft flew to an area northwest of Albuquerque at approximately 450 mbar (21,700 ft, 6.6 km). The track of the flight, mainly in thin cirrus, is shown in Figure 20. The horizon was rarely obscured, but filaments of cirrus almost invariably surrounded the plane. This is corroborated by the nose camera film and the Mission Director's notes. Figures 21 and 22 show the type of cirrus that predominated throughout the flight. The cirrostratus shown in Figure 21 (1905Z) was one of the few solid patches of cloud penetrated by the aircraft.

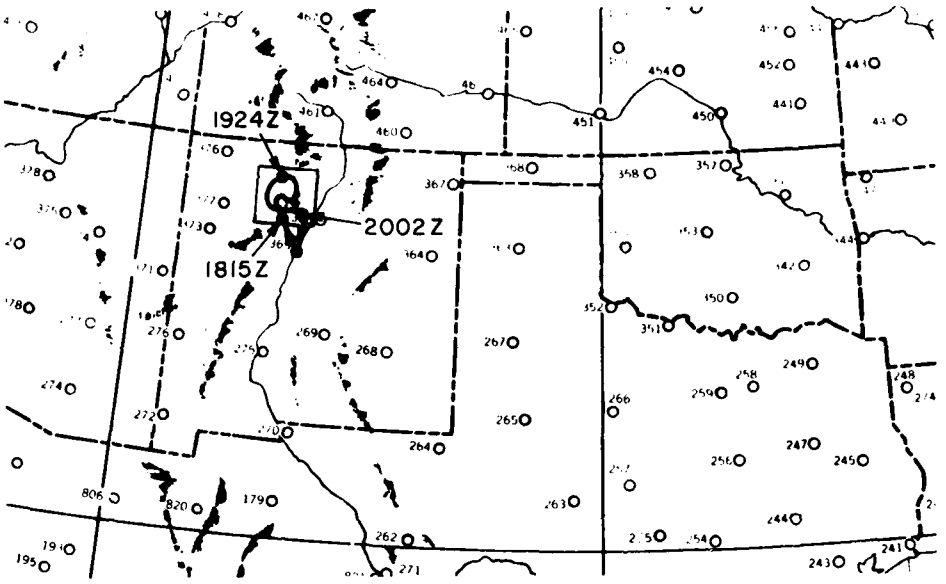


Figure 20. Track and Sampling Area of the 3 February 1979 Flight

3.1 Data Variations During the Flight

Figure 23 shows the altitude, temperature, cloud conditions, liquid water content (LWC), medium volume diameter (Do), and particle density (NT) sensed by the airplane during the flight of 3 February. The nose camera film and the Mission Director's notes concur that the airplane was in or near thin cirrus clouds throughout the greater part of the flight. The liquid water content frequently approached 10^{-2} g m^{-3}, but the largest value recorded in Figure 23 is within half of an order

Figure 21. Cirrus Encountered at 1905Z on 3 February 1979

Figure 22. Cirrus Wisps Seen During the 3 February Flight

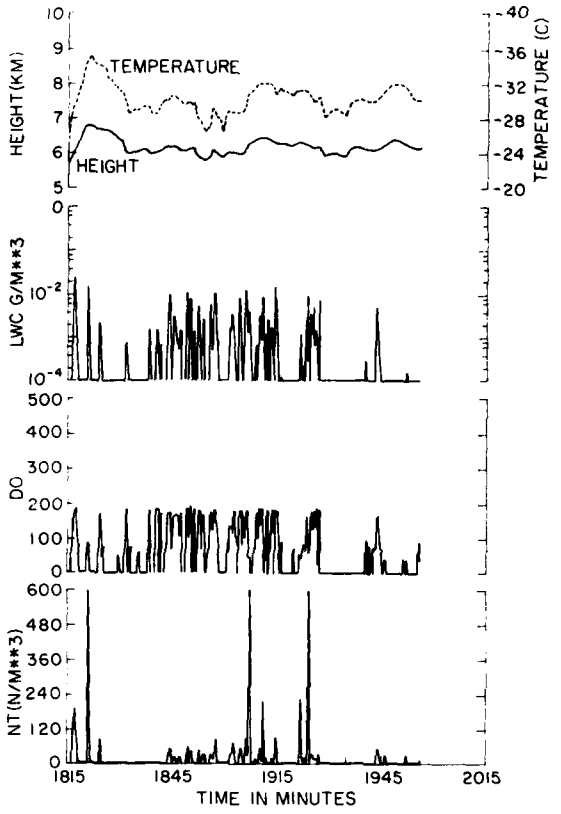


Figure 23. Altitude, Temperature, Liquid Water Content, Median Volume Diameter, and Number Density vs Time on 3 February 1979

of magnitude above this value. The median volume diameter approached 200 μm frequently, but never exceeded this value. Thus the cirrus observed was quite uniform, consistent both in particle size and liquid water content. Most of the particles recorded were in the scatter (2 to 30 μm) and cloud probe (30 to 300 μm) range. Only rarely were particles observed in the larger precipitation probe range (300 to 4500 μm). Since the "total" values displayed here represent the sum of the cloud and precipitation probes, and since the precipitation probe recorded very few particles, the figure mainly reflects cloud probe data.

The form factor provides a measure of consistency of particle sizes in a given particle distribution. Varley[12] used it in the investigation of large scale storms. The maximum value of the form factor is 1, indicating that all of the particles in

12. Varley, D. J. (1980) Microphysical Properties of a Large Scale Cloud System, 1-3 March 1978, Environmental Research Papers, No. 690, AFGL-TR-80-0002, ADA 083140, 100 pp.

the sample fall into the same size category; a low value indicates a distribution with particles of many sizes. Figure 24 shows the form factor as a function of time on this flight. Whenever the aircraft was actually in clouds, the form factor was unusually high, frequently reaching values of 0.8 or 0.9, indicating that the particles were of a uniform size. Figure 24 shows many instances when the form factor was zero, but very few instances between 0.01 and 0.50. The zero form factors represent times when no particles were counted. As a rule, the cirrus observed on this flight, both visible and subvisible, shared a consistency of particle size and type.

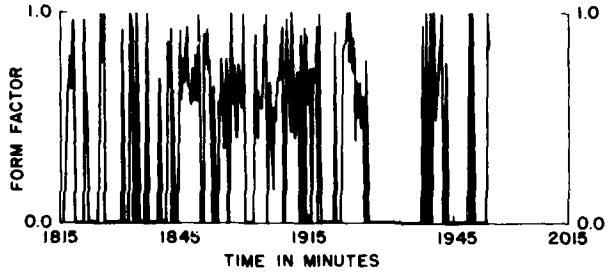


Figure 24. Form Factor vs Time on 3 February

To reiterate, the cirrus sampled on this mission was, in general, uniform, but thin. Particle size and liquid water content showed comparatively little variance, and the high form factors indicate that at a given time, the cirrus consisted of particles of approximately the same size.

Fifteen-second averages of data obtained on this flight, together with observations of the Mission Director, are presented in Appendix A.

3.2 Data for Particular Passes

Four 5-min periods have been selected for closer study. The first corresponds to a time during which neither the nose camera film, nor the Mission Director's report indicated the existence of cirrus. Nevertheless, particles were observed. The other three correspond to times when liquid water content (LWC), median particle size (DO), and particle density (or number total, NT) were high. These periods will now be discussed in more detail.

1. During the period from 1837 to 1842Z, the airplane appeared to be in clear air. There was considerable activity, however, as seen in Figure 25. Both

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-11 ON 03 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 18:37:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.53E+05	26	0.	413	0.
4	5.35E+05	47	1.21E+03	644	0.
6	4.20E+05	67	0.	923	0.
8	3.42E+05	87	0.	1202	0.
10	4.95E+05	108	4.48E+02	1481	0.
12	3.05E+05	128	1.69E+02	1760	0.
14	5.69E+05	148	1.28E+02	2039	0.
16	2.66E+05	169	1.10E+02	2318	0.
18	4.99E+05	189	1.17E+03	2597	0.
20	1.90E+05	209	2.58E+02	2876	0.
22	1.16E+05	230	7.02E+02	3155	0.
24	2.29E+05	250	3.09E+02	3434	0.
26	1.93E+05	271	4.55E+02	3713	0.
28	3.73E+04	291	6.67E+02	3992	0.
30	0.	311	9.79E+02	4271	0.
					TOTALS
LWC	1.81E-05		7.42E-05		0. *
NED #	21		125		0

PRESS (MB)
480.26

ALT (KM)
5.87

T -29.85C

FPT -29.1C

TAS (M/S)
96.84

Z 2.53E-04

FORM F .77

NT(N/M**3)
1.3452E+02

7.42E-05
125

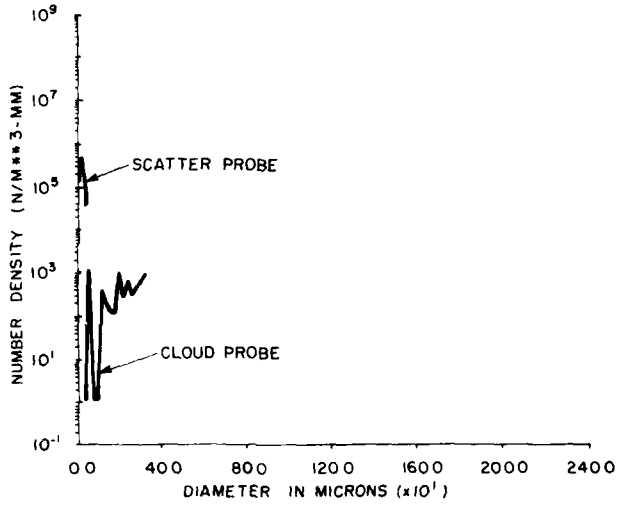


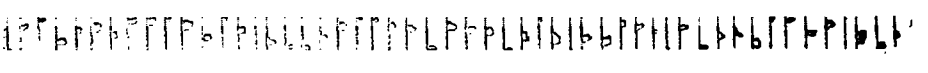
Figure 25. Particle Distribution: 3 February 1837-1842Z

the axial scattering spectrometer probe and the cloud probe registered counts in most channels. There was a small number of particles in the 30- to 100-μm size range, but an increased number of particles between 100- and 350-μm size Although much of the 2-D data were not usable, the sample offers a good idea of the uniformity of crystal size that the 1-D system shared. Cohen and Barnes[4] noted an occurrence of particles in clear air during the flight of 5 April 1978. In that case and also in this, there were particles in a larger size range, but a lack of particles in the cloud probe range. As noted in that report, it is possible that the smaller particles were either evaporated or absorbed by the larger ones. A similar mechanism may have been operating at this time. There were cirrus clouds in the area, but none in the immediate vicinity of the airplane. Varley, Cohen, and Barnes[5] noted that the Mission Director's observations of cirrus seemed more closely correlated to the density of particles than to either particle size or liquid water content. In this case, the density was the smallest of any of the cases examined on this flight; also there was the smallest LWC value. Although the median volume diameter is large, this is due to the lack of small particles rather than an increase in over-all particle size. Therefore, while it is tempting to say that this observation confirms that of the earlier report, no such definitive statement can be made at this time. It is, however, evident that a large variety of sizes and types of particles may be present without producing a visible cloud.

2. Figure 26 examines a period of time which followed closely that seen in Figure 25. At this time (1845 to 1850Z), however, both the Mission Director and the nose camera film observed clouds. Only the first channel of the precipitation probe reported any particles, but in this case there were many particles in the 30- to 100-μm portion of the cloud probe range. No precipitation probe data are recorded on the plot shown in Figure 26, since the program used to generate these data ignores the first channel of the precipitation probe if the second channel of that probe is zero. The particle density reported by the cloud probe increased by almost an order of magnitude in roughly 20 km. The LWC also increased sharply; in this case, by a factor of 7. As supported by 2-D data most of the particles observed were small snow and bullet rosettes. As in the previous example, the size of the particles remained quite uniform, confirming the large form factors observed.

3. During the period from 1904 to 1909Z, some of the thickest clouds observed on this flight were encountered. Although still thin when compared to cirrus of other flights, these clouds briefly obscured the horizon. As the 2-D data in Figure 27 show, there was a greater variety of particle shapes and sizes. The form factor of 0.33 confirms this. Again, there was an increase of particle density and liquid water content as compared to previous periods. Since all channels of the cloud probe, as well as the first two of the precipitation probe, reported

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS



AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-11 ON 03 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 18:45:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	2.66E+05	26	0.	413	1.98E+00
4	6.81E+05	47	5.82E+03	644	0.
6	1.96E+06	67	4.38E+03	923	0.
8	2.46E+06	87	2.27E+03	1202	0.
10	2.30E+06	108	6.74E+02	1481	0.
12	2.30E+06	128	1.30E+03	1760	0.
14	2.20E+06	148	2.32E+03	2039	0.
16	1.66E+06	169	2.98E+03	2318	0.
18	1.70E+06	189	3.66E+03	2597	0.
20	1.62E+06	209	5.16E+03	2876	0.
22	1.02E+06	230	5.12E+03	3155	0.
24	1.25E+06	250	4.78E+03	3434	0.
26	1.21E+06	271	4.36E+03	3713	0.
28	1.02E+06	291	3.97E+03	3992	0.
30	6.04E+05	311	3.62E+03	4271	0.
LWC	1.3?E-04		4.93E-04		6.20E-07
NEB	24		116		181

PRESS (MB) 475.56
ALT (KM) 5.94
T -30.65C
FPT -30.0C
TAS (M/S) 96.98
Z 1.48E-03
FORM F .76
NT(N/M**3) 1.0271E+03
TOTALS 4.93E-04 116

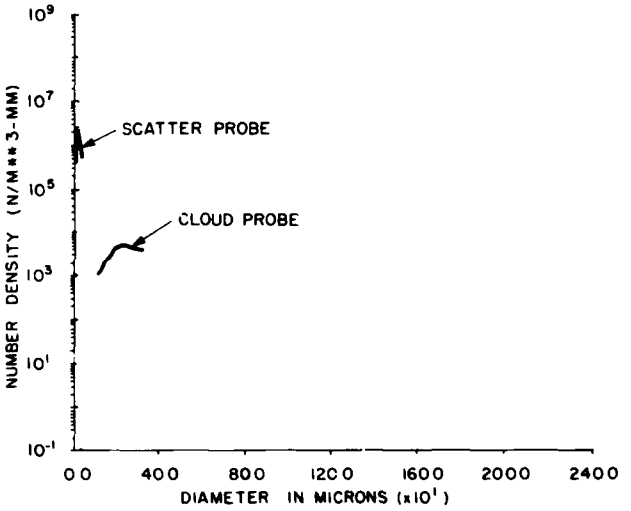


Figure 26. Particle Distribution: 3 February 1845-1850Z

REPRESENTATIVE PMS
2-D *CLOUD PROBE*
SHADOWGRAPHS

AFUL CIRRUS STUDY BY AFGL
FLIGHT E79-11 ON 03 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 19:04:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	6.48E+06	26	2.99E+05	413	2.85E+02
4	1.04E+07	47	2.05E+05	644	1.22E+00
6	3.71E+06	67	8.05E+04	923	0.
8	5.83E+06	87	4.35E+04	1202	0.
10	7.41E+06	108	2.16E+04	1481	0.
12	6.87E+06	128	9.80E+03	1760	0.
14	5.86E+06	148	3.74E+03	2039	0.
16	5.05E+06	169	3.85E+03	2318	0.
18	4.73E+06	189	2.54E+03	2597	0.
20	4.66E+06	209	4.04E+03	2876	0.
22	5.48E+06	2..	4.85E+03	3155	0.
24	4.77E+06	250	3.69E+03	3434	0.
26	3.61E+06	271	3.70E+03	3713	0.
28	2.14E+06	291	3.72E+03	3992	0.
30	1.51E+06	311	2.43E+03	4271	0.
LWC	4.25E-04		7.21E-04		1.51E-04
MED D	23		84		182

PRESS (MB) 468.27

ALT (KM) 6.05

T -31.2C

FPT -30.8C

TAS (M/S) 96.78

Z 3.10E-03

FORM F .33

NT(N/M**3) 8.0490E+03

TOTALS
6.72E-04
102

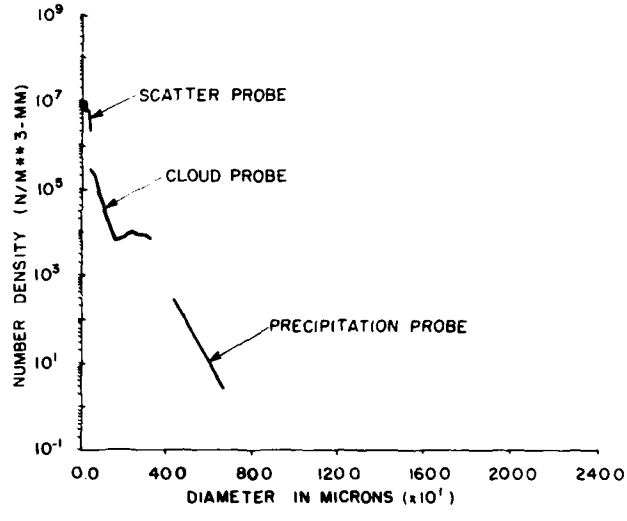


Figure 27. Particle Distribution: 3 February 1904-1909Z

data, the totals in Figure 27 reflect both. In spite of the addition of the precipitation probe data, the median volume diameter was lower than for either of the previous periods, owing to an increase in the number of smaller particles. The first two channels of the cloud probe registered over 10^5 particles per cubic meter, as against 10^3 in the earlier periods. This increase in particles may have caused the apparent thickness of clouds.

4. Figure 28 shows data from 1921 to 1926Z. During this time, the clouds were more uniform than in the previous period, but they never did achieve the opacity observed earlier. Liquid water content and density have increased but slightly over the last period. Most of the increase in density is attributed to an increase in particles in channels 3 to 10 (60 to 230 μm) of the cloud probe. The greater number of smaller particles can be seen in the 2-D data also. The median volume diameter (74 μm) for this period is smaller than that for any other period in this flight. Thus in this case, an increase in density did not lead to an increase in opacity; rather, it represented a more uniform texture.

4. THE FLIGHT OF 4 FEBRUARY 1979

On 4 February 1979, the aircraft left Kirtland AFB at 2006Z. This flight examined a band of cirrus southeast of Albuquerque (see Figure 29 for area). The greater part of the flight took place near the 300-mbar surface (about 9 km), although the final part approached the 500-mbar level (5.5 km).

As noted earlier, there were no surface systems in the area. Therefore, the cirrus was more clearly delineated. During some periods, the aircraft was in solid thin cirrus, while at other times, the air was unusually clear. As Figures 30 and 31 show, the clouds had definite shapes. Much of the cirrus was above the aircraft; in some cases, fall-out from the higher clouds was also present.

4.1 Data Variations During the Flight

Figure 32 shows the height, temperature, LWC, DO, and NT values observed during the 4 February flight. There were several periods during which LWC, DO, and NT values were minimal; frequently, even the ASSP showed no data. From 2132 to 2156Z, the aircraft was in clear air below a solid deck of cirrostratus. Some fall-out observed early in this period will be examined in the next section. At other times, correlations between the visible cloud and the LWC, DO, and NT data were in good agreement.

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-11 ON 03 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 19:21:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	7.05E+06	26	1.90E+05	413	2.00E+02
4	1.47E+07	47	1.82E+05	644	3.24E-01
6	5.13E+06	67	1.09E+05	923	0.
8	4.24E+06	87	6.64E+04	1202	0.
10	3.51E+06	108	4.06E+04	1481	0.
12	3.25E+06	128	2.68E+04	1760	0.
14	3.07E+06	148	1.19E+04	2039	0.
16	4.71E+06	169	9.63E+03	2318	0.
18	4.04E+06	189	6.80E+03	2597	0.
20	4.86E+06	209	4.65E+03	2876	0.
22	4.41E+06	230	4.14E+03	3155	0.
24	4.49E+06	250	2.77E+03	3434	0.
26	3.59E+06	271	2.81E+03	3713	0.
28	3.40E+06	291	2.85E+03	3992	0.
30	2.00E+06	311	1.83E+03	4271	0.
LWC	4.41E-04		8.64E-04		9.57E-05
MED D	24		67		181

PRESS (MB) 469.95
ALT (KM) 6.03
T -31.32C
FPT -29.5C
TAS (M/S) 94.74
I 2.26E-03
FORM F .39
NT(#/M**3) 9.6426E+03
TOTALS 9.60E-04 74

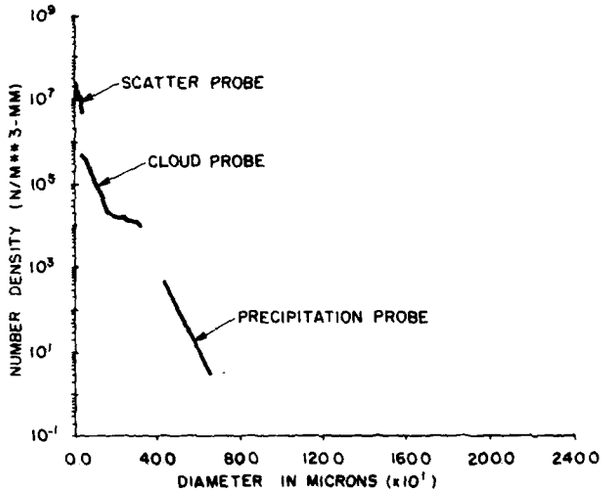


Figure 28. Particle Distribution: 3 February 1921-1926Z

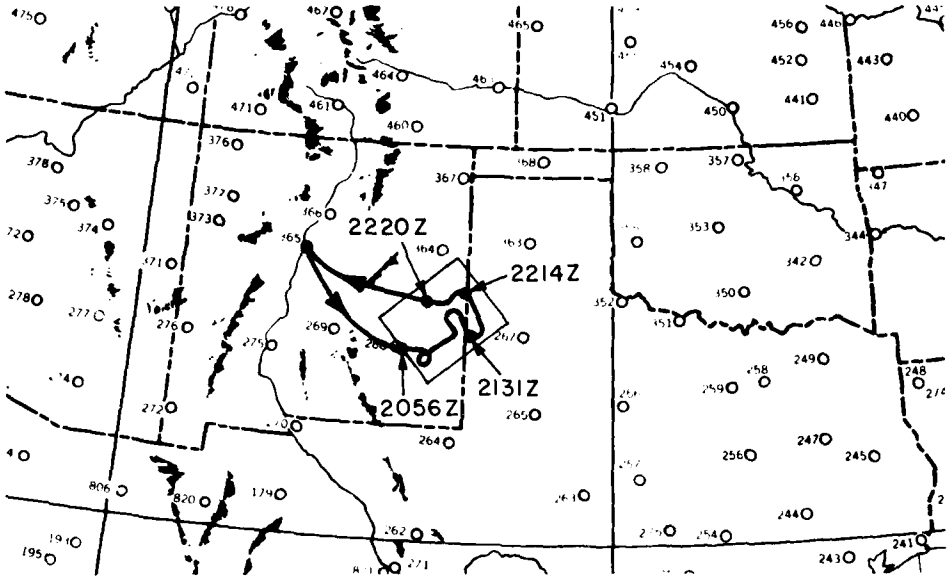


Figure 29. Track and Sampling Area of the 4 February Flight

Figure 30. Cirrostratus Clouds Typical of Those Present on 4 February

Figure 31. Higher Cirrostratus Clouds Which May Have Provided Fall-out

The total lack of ASSP data, while not common, has occurred on previous flights. Barnes[13] reported two kinds of subvisible cirrus: The first consists of ice crystals which have fallen from a higher layer; Cohen and Barnes[4] found particles as large as 2000 μm in apparently clear air. The second type consists of smaller particles, generally less than 10 μm, which are present even on flights through cloudless skies. The absence of these small particles at temperatures below -20°C has been the exception. Thus the lack of any ASSP data indicates that even subvisible cirrus was absent.

The form factor (Figure 33) proved variable, but generally quite high while the airplane was in clouds. Notably, while the aircraft was in fall-out from the higher clouds, it was somewhat lower, reflecting a wider variety of sizes. Data obtained on this flight, together with the Mission Director's comments, are located in Appendix B.

13. Barnes, A.A. (1981) Observations of Ice Crystals in Clear, Journal de Recherches Atmospheriques, Vol 14, No.3-4, AFGL-TR-81-0347, AD A108914.

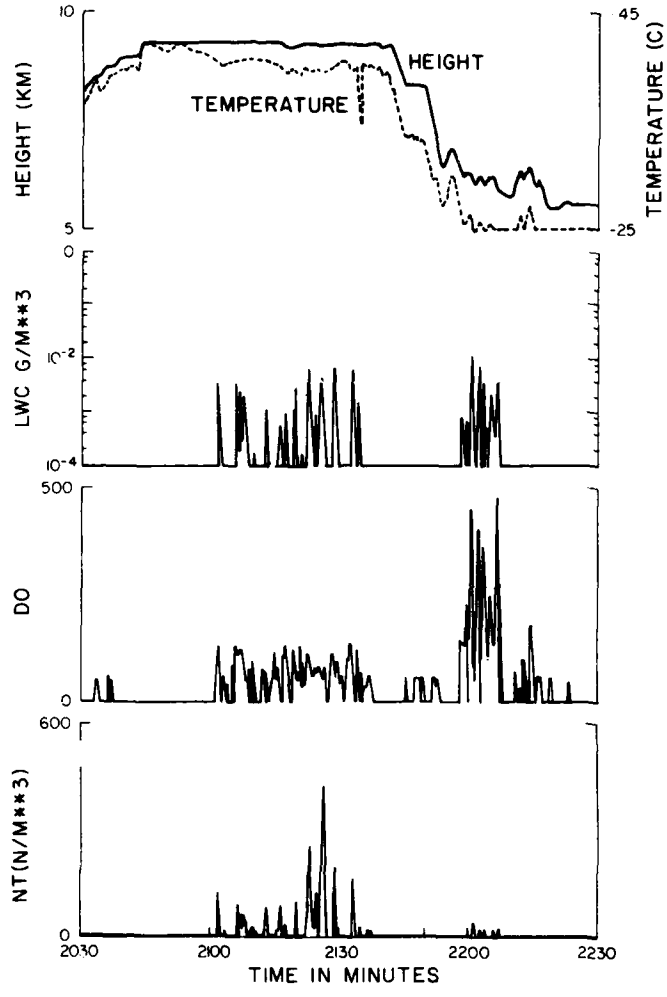


Figure 32. Altitude, Temperature, Liquid Water Content, Median Volume Diameter, and Number Density vs Time on 4 February

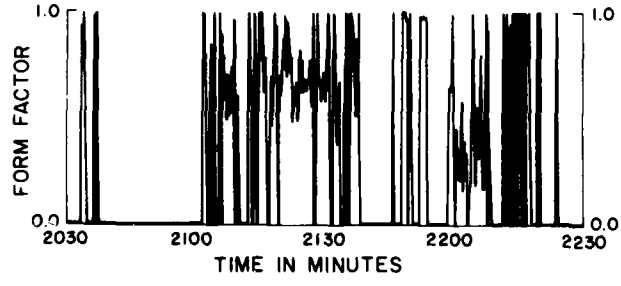


Figure 33. Form Factor vs Time on 4 February

4.2 Data for Particular Passes

Four periods of 5 min each have been selected for closer study. In three of them the aircraft was in tenuous to thin cirrus; in the other period (2133 to 2138Z) the airplane was in clear air below a solid deck of cirrus.

1. The aircraft was in cirrus almost constantly from 1955 to 2132Z. During the period from 2105 to 2110Z, the cirrus was less dense than at other times; Figure 34 shows some of the data observed. The particle distribution bears a similarity to distributions in the later periods of the 3 February flight. The density of particles in the cloud probe (40- to 400-μm) range is about $10^3/m^3$-mm. Particles in this size range seem to have a strong effect on whether the cirrus is visible or subvisible. As the 2-D data show, bullet rosettes were common among the ice crystals observed in this thin but visible cirrus cloud, exhibiting many different shapes.

2. Figure 35 gives a look at another portion of this same cloud band. At that time, however, (2122 to 2127Z), the cirrus was much more dense, as noted by both the in-flight observer and the nose camera film. Unlike the earlier time period, the cirrus was now dense enough to obscure the horizon and limit the visibility of the aircrew. As Figure 35 shows, particles in the cloud probe size range were more numerous. As an example, cloud probe channel 5 (centered at 108 μm) reported 4.31×10^3 particles per cubic meter from 2106 to 2111Z, but it was an order of magnitude higher ($4.30 \times 10^4/m^3$) from 2122 to 2127Z. As the 2-D data show, the particle shapes were not different. Particle density above 300 μm was unchanged, but the particle density in the 20 to 200-μm range strongly affected the opacity of the cirrus. As Figure 25 (in subvisible cirrus) shows, when the cirrus is even more tenuous, particle density at this size (Cloud Probe Channel 5) was only $4.48 \times 10^2/m^3$), yet another order of magnitude smaller.

3. From 2133 to 2138Z, the aircraft was in tenuous to subvisible cirrus, but a solid deck of cirrostratus appeared to be about 1000 to 2000 ft above the airplane. Although cirrus did not appear, the distribution (Figure 36) shows many particles in the 300- to 400-μm range and also a greater number of larger particles – compared to earlier samples examined on this flight. These were probably fall-out from the higher clouds. Perhaps the presence of the cirrostratus above (see Figure 30) made observation of tenuous cirrus at flight level difficult. The cirrostratus deck seen later (Figure 30) was above the airplane; this produced an excellent halo. The 2-D data show a greater variety of particle types and give some evidence that larger particles have fallen from the cirrostratus deck.

4. The last period examined looks at cirrostratus at a lower level. The airplane had descended from 9.3 km (31,000 ft) to 6.2 km (20,000 ft) for investigation of a lower layer of cloud. The cirrostratus appeared tenuous, much as it had during the first period (2106 to 2110Z). The density of particles, however, had

REPRESENTATIVE PMS
2 D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-12 ON 04 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 21:06:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.70E+05	26	2.99E+04	413	2.36E+02
4	8.20E+05	47	2.53E+04	644	3.64E-01
6	1.75E+06	67	1.02E+04	923	0.
8	4.38E+06	87	1.02E+04	1202	0.
10	4.58E+06	108	4.31E+03	1481	0.
12	3.11E+06	128	5.16E+03	1760	0.
14	3.05E+06	148	3.77E+03	2039	0.
16	2.63E+06	169	4.46E+03	2318	0.
18	2.38E+06	189	4.14E+03	2597	0.
20	2.01E+06	209	4.09E+03	2876	0.
22	1.87E+06	230	6.41E+03	3155	0.
24	1.42E+06	250	4.25E+03	3434	0.
26	1.07E+06	271	3.91E+03	3713	0.
28	9.06E+05	291	3.60E+03	3992	0.
30	8.20E+05	311	2.29E+03	4271	0.
					TOTALS
LWC	1.72E-04		5.05E-04		1.13E-04
MED D	22		107		181

PRESS (MB) 313.93
ALT (KM) 8.86
T -40.25C
FPT -11.1C
TAS (M/S) 130.56
Z 2.59E-03
FORN F .53
NT(N/M**3) 1.9264E+03
6.19E-04
116

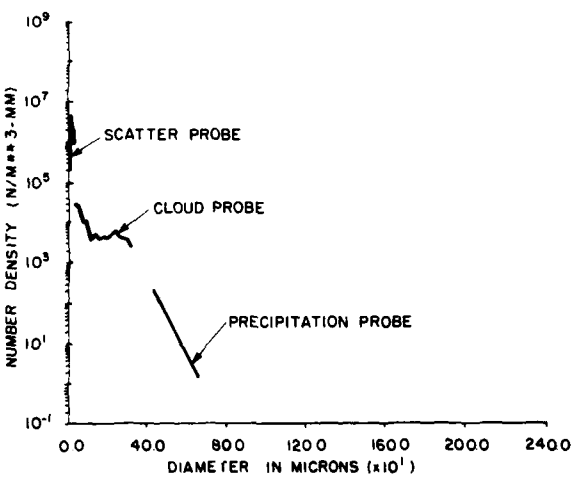


Figure 34. Particle Distribution: 4 February 2106-2111Z

REPRESENTATIVE PMS
2 D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-12 ON 04 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 21:22:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	2.64E+05	26	1.16E+05	413	1.65E+00
4	2.05E+06	47	1.50E+05	644	0.
6	4.98E+06	67	9.01E+04	923	0.
8	1.17E+07	87	5.99E+04	1202	0.
10	1.12E+07	108	4.30E+04	1481	0.
12	9.87E+06	128	4.55E+04	1760	0.
14	8.52E+06	148	3.22E+04	2039	0.
16	5.95E+06	169	2.55E+04	2318	0.
18	6.26E+06	189	1.89E+04	2597	0.
20	5.57E+06	209	1.10E+04	2876	0.
22	4.14E+06	230	8.72E+03	3155	0.
24	4.14E+06	250	7.16E+03	3434	0.
26	3.14E+06	271	5.02E+03	3713	0.
28	3.10E+06	291	3.51E+03	3992	0.
30	2.46E+06	311	2.46E+03	4271	0.
LWC	6.84E-04		1.35E-03		9.47E-07
MED D	23		79		181

PRESS (MB) 315.16
ALT (KM) 8.83
T -39.2C
FPT -39.2C
TAS (M/S) 124.16
Z 2.00E-03
FORM F .57
NT(N/M**3) 1.0240E+04
TOTALS 1.35E-03 79

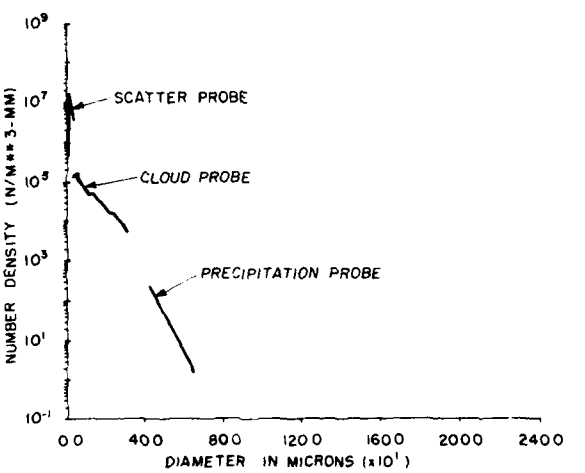


Figure 35. Particle Distribution: 4 February 2122-2127Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-12 ON 04 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 21:33:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	3.46E+05	26	7.61E+04	413	3.50E+02
4	1.13E+06	47	3.50E+04	644	3.57E+00
6	1.52E+06	67	1.90E+04	923	6.45E-02
8	4.61E+06	87	8.20E+03	1202	0.
10	5.91E+06	108	7.30E+03	1481	0.
12	5.20E+06	128	5.05E+03	1760	0.
14	5.44E+06	148	2.97E+03	2039	0.
16	3.49E+06	169	2.30E+03	2318	0.
18	3.71E+06	189	2.39E+03	2597	0.
20	2.66E+06	209	3.10E+03	2876	0.
22	2.49E+06	230	2.07E+03	3155	0.
24	2.03E+06	250	4.50E+03	3434	0.
26	1.63E+06	271	3.96E+03	3713	0.
28	1.17E+06	291	3.47E+03	3992	0.
30	9.05E+05	311	2.37E+03	4271	0.
LWC	2.38E-04		4.52E-04		2.04E-04
NED	22		112		103

PRESS (MB) 316.08
ALT (KM) 8.81
T -38.80C
FPT -39.6C
TAS (M/S) 122.56
Z 3.92E-03
FORM F .43
NT(#/M**3) 2.1544E+03
TOTALS 4.56E-04 125

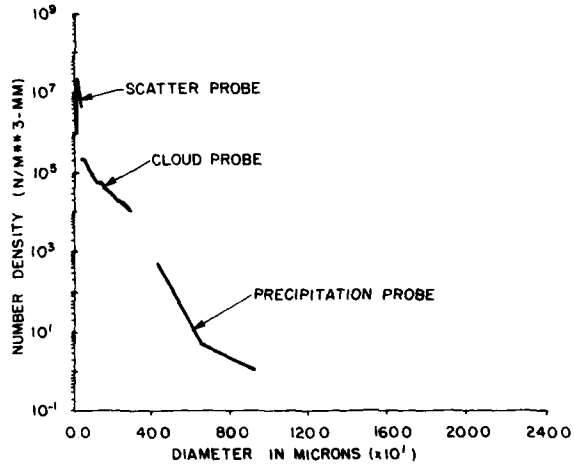
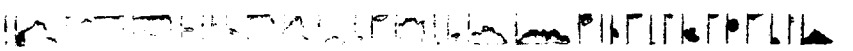


Figure 36. Particle Distribution: 4 February 2133-2138Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS



AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-12 ON 04 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 22:01:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.47E+07	26	4.04E+03	413	4.06E+02
4	5.05E+07	47	1.90E+04	644	1.31E+02
6	5.15E+07	67	4.97E+03	923	5.38E+01
8	2.89E+07	87	7.08E+03	1202	1.52E+01
10	1.61E+07	108	3.41E+03	1481	2.13E+00
12	7.47E+06	128	2.09E+03	1760	3.62E-01
14	4.25E+06	148	1.66E+03	2039	0.
16	3.11E+06	169	8.78E+02	2318	0.
18	3.32E+06	189	4.25E+02	2597	0.
20	2.73E+06	209	7.90E+02	2876	0.
22	3.70E+06	230	5.05E+02	3155	0.
24	2.99E+06	250	5.50E+02	3434	0.
26	2.36E+06	271	4.37E+02	3713	0.
28	1.92E+06	291	7.36E+02	3992	0.
30	9.27E+05	311	6.68E+02	4271	0.
LWC	3.36E-04		1.16E-04		1.62E-03
MED D	22		98		378

PRESS (MB) 475.62
ALT (KM) 5.94
T -24.61C
FPT -24.4C
TAS (M/S) 106.87
Z 2.44E-01
FORM F .21
NT(N/M**3) 1.0552E+03
TOTALS 1.73E-03 364

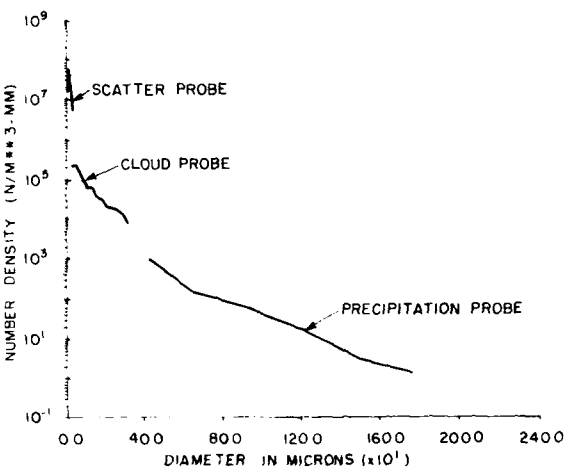


Figure 37. Particle Distribution: 4 February 2201-2206Z

increased substantially. This was especially true of the larger particles. As Figure 37 shows, particles as large as 1760 μm were present. The 2-D data show that small snow was common, perhaps more so than bullet rosettes, although for consistency, the latter were used to process the 1-D data. Again, there were cloud layers above, and this may have made the cirrostratus at the flight level appear less dense.

5. THE FLIGHT OF 5 FEBRUARY 1979

The last flight of this series was the return of the C-130 to its home base, Wright-Patterson AFB, Ohio. The aircraft traversed a large amount of territory, both geographically and meteorologically (see Figures 14 and 38). During the first two hours, the aircraft sampled weak cirrus which was the result of convergence ahead of an upper air trough (which appeared as a cutoff low at 500 mbar – see Figure 15). Figures 39 and 40 show this cirrus. Later, the aircraft flew along the extreme northern boundary of the cloud shield of a stationary front. The front itself was 400 nmi south of the aircraft, but a continuous shield extended from the front. As Figure 41 shows, a cirrostratus layer was well-defined. During much of this time (approximately 1910 to 2020Z), there was a solid cloud shield south of the aircraft, while skies were clear to the north. During the last two hours of the flight, the aircraft moved into a strong polar continental air mass. Only very thin, wispy cirrus such as that in Figure 42 remained.

The aircraft flew at an altitude of 6 to 7 km (20,000 to 23,000 ft) throughout most of its journey. During the final portion, however, the airplane climbed to 9.2 km (30,000 ft) to sample the thin wispy cirrus in the polar air.

5.1 Data Variations During the Flight

Figure 43 shows variations in height, temperature, LWC, DO, and NT during the first half of the flight of 5 February. During the early portion of the flight (to approximately 1905Z), the cirrus was isolated; LWC, DO, and NT values dropped to zero temporarily as the aircraft moved through cloudless areas. Due to the middle and upper level convergence in the area, upward vertical motion was limited. Thus very few particles were found outside of the visible cirrus. Data presented in Figure 43 are continued in Figure 44. A second type of cirrus cloud (which marked the northern edge of the cloud shield of a front) provided varying values of LWC, DO, and NT, but only rarely did these values drop to zero. From 1911 to 1951Z, LWC values computed from cloud and precipation probe data dropped to zero only twice, once for 15 sec and once for 90 sec. While fluctuations in the amount of moisture varied, there was almost always something to sample due to

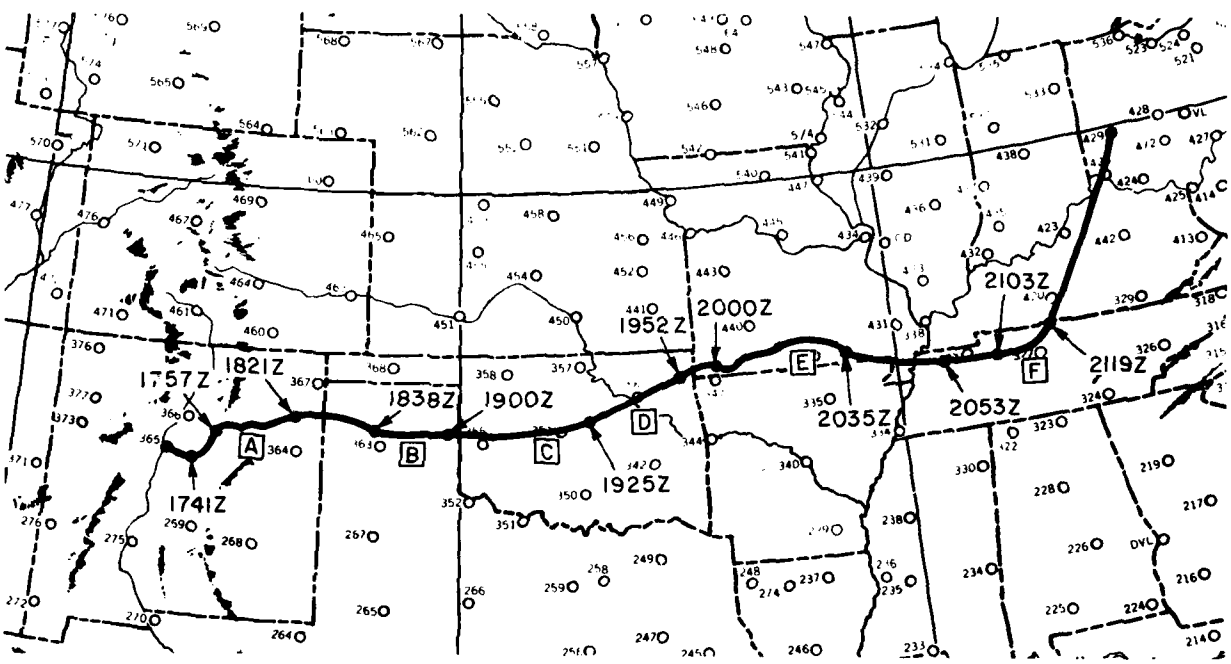


Figure 38. Route of Flight From Kirtland AFB to Wright-Patterson AFB on 5 February

Figure 39. Cirrus Over Eastern New Mexico on 5 February

Figure 40. Cirrostratus Near the Texas-New Mexico Border

Figure 41. Cirrostratus Representing the Northern Edge of a Frontal Cloud Shield

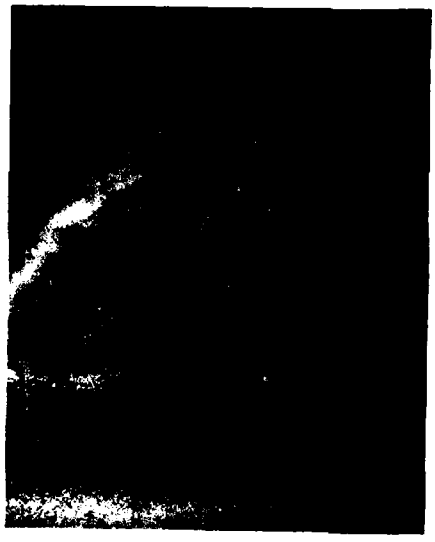


Figure 42. Cirrus Wisps in Continental Polar Air on 5 February

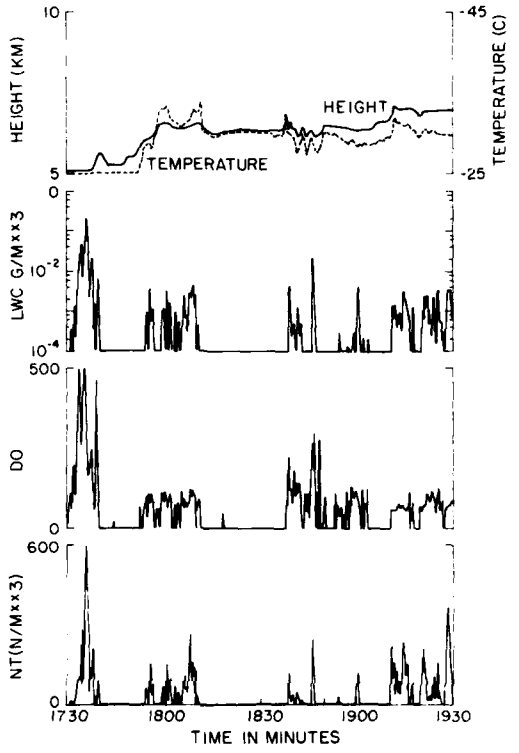


Figure 43. Altitude, Temperature, Liquid Water Content, Median Volume Diameter, and Number Density vs Time From 1730 to 1930Z on 5 February

the upward vertical motion along the frontal surface. The final section of the flight left the frontal boundary behind and moved into another area of predominantly descending motion. Again, the cirrus was more widely spaced and the air around the clouds contained very few particles.

The form factor during this time is presented in Figure 45 and continued in Figure 46. Both the early and late portions of the flight reveal widely fluctuating values of these form factors. Those in the last part of the flight (the polar high) tend to be higher, indicating a greater consistency of particle size in the cold high. During the middle part of the flight, the form factor was less variable in value, indicating less variety in the particle distribution as a function of time. The values were quite high, generally averaging about 0.70. The high form factors appear to be more common in cirrus less closely associated with surface features or associated with weak surface features. In an earlier report of this series,[5] the flight of 2 February 1979 yielded fairly high form factors in the presence of only weak

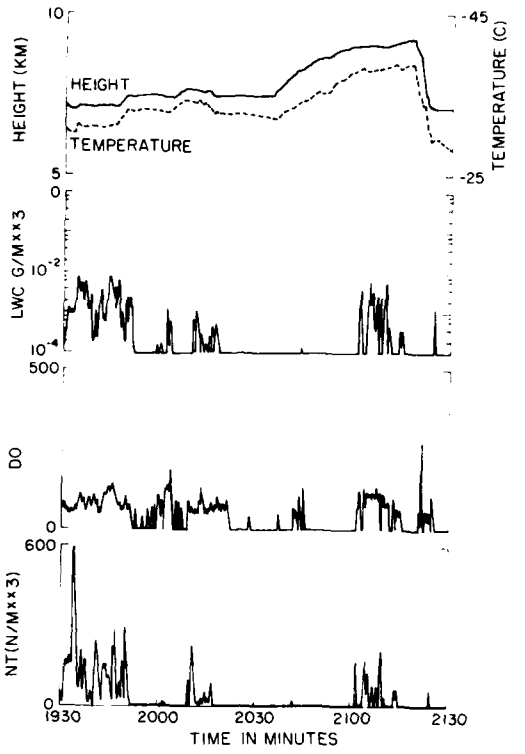


Figure 44. Altitude, Temperature, Liquid Water Content, Median Volume Diameter, and Number Density vs Time From 1930 to 2130Z on 5 February

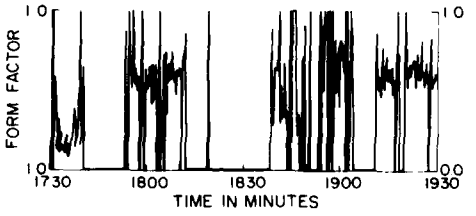


Figure 45. Form Factor vs Time From 1730 to 1930Z on 5 February

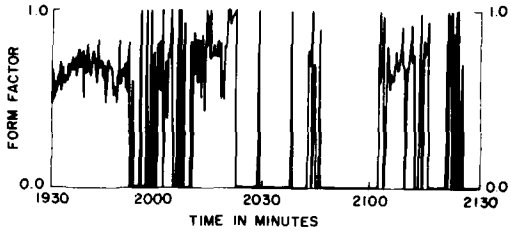


Figure 46. Form Factor vs Time From 1930 to 2130Z on 5 February

surface features, while the flights of 28 and 29 January yielded much lower form factors (generally 0.30 to 0.50) when dealing with a strong surface storm. The flights of 3 and 4 February 1979, discussed earlier, show results similar to those of 2 February. Both Varley[12] and Cohen[14] reported much lower form factors when looking at large scale storms. Plank[15] notes that the form factor is designed to indicate the type of particle distributions. Thus there is some evidence that cirrus associated with strong surface features will have a different, much less uniform distribution of particles than cirrus associated with either weak surface or upper air features. The middle section of the 5 February flight examined clouds which were formed from a surface feature, but by the time the cloud mass had arrived at 23,000 feet, it had lost the characteristically wide variety of particle sizes. Most probably the larger particles had precipitated out, leaving only smaller particles. Data and Mission Director's comments from this flight are in Appendix C.

5.2 Data for Particular Passes

Six passes of 5 minutes each were selected for closer examination. As Figure 38 shows, they provide a cross section of the data observed during this flight.

1. The first pass (1806-1811Z) occurred over eastern New Mexico, shortly after the airplane arrived at a flight level of 6.5 km (21,000 ft). The cirrus here was the result of convergence ahead of a 500-mbar cutoff low. It was visible, but

14. Cohen, I.D. (1981) Development of a Large Scale Cloud System, 23-27 March 1978, Environmental Research Papers, No.739, AFGL-TR-81-0127, AD A106417, 112 pp.

15. Plank, V.G. (1977) Hydrometeor Data and Analytical-Theoretical Investigations Pertaining to the SAMS Rain Erosion Program of the 1972-73 Season at Wallops Island, Virginia. AFGL/SAMS Report No.5, Environmental Research Papers No.603, AFGL-TR-77-0149, AD A051193.

very thin. The particle distribution is shown in Figure 47. The number of particles and ice water content were greater than the two cases of subvisible cirrus observed on 3 and 4 February. The ice water content is similar to that observed in most of the passes which contained visible cirrus clouds. Notably there was more cirrus above, and this may have made the cirrus at the aircraft altitude more difficult to discern. The form factor was 0.49, a value higher than that observed with surface-storm related cirrus, but less than usually observed with nonsurface-storm related cirrus. A surface trough was present, but the upper air feature was probably responsible for the cirrus. The form factor decreased as the aircraft entered the frontal cirrus later in the flight.

2. At the time of the second pass, the airplane was near Amarillo, Texas. By 1838Z, the aircraft was just below a cirrostratus deck which represented the extreme northern edge of the cloud shield of the stationary front in the Gulf of Mexico. The thin cirrus at the aircraft altitude may have been supplemented by fall-out from the cirrostratus above. The form factor was considerably smaller (0.32) than before, and the precipitation probe was quite active, registering particles as large as 1200 μm (see Figure 48). The number of particles in the smaller size range had decreased.

3. The third data pass (1912 to 1917Z) occurred over western Oklahoma. The aircraft was flying parallel to the front in the Gulf of Mexico. To the right of the aircraft was a solid cirrus overcast, whereas the left (north) was clear. The aircraft was in thin but barely visible cirrus. As Figure 49 shows, most activity was confined to the ASSP and cloud probes. The activity at the smaller sizes of the cloud probe (20-200 μm) increased over the earlier passes. The medium volume diameter was smaller and the form factor higher, indicating a more uniform distribution of small particles. The larger particles may have precipitated out as they moved up the frontal boundary. Thus this high cirrus, which resulted from a surface front far to the south appeared to be changing character, becoming more like jet-stream generated cirrus.

4. The fourth data pass (1932-37Z) was in similar but heavier cirrus over eastern Oklahoma. As Figure 50 shows, the sizes of the particles had not increased, but the number of particles had. The aircraft was still in cirrus which represented the northern edge of the cloud shield of a stationary front; however, now the airplane was in a stronger area of the front. Figures 15 and 16 show that there was horizontal upper air divergence, implying strong upward vertical motion in this area. The median volume diameter had not changed, but the IWC had tripled. The nose camera film and Mission Director's notes both indicated that the clouds had thickened. This thicker cloud was a result of the increase in the number, rather than the size of the particles. The upward vertical motion of air may have inhibited the sublimation of some particles, increasing the particle density.

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 GN 05 FEB 79 30: SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 18:04:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	5.01E+05	26	8.16E+04	413	3.11E+02
4	2.58E+06	47	1.20E+05	644	2.19E-01
6	3.90E+06	67	6.98E+04	923	0.
8	4.92E+06	87	5.50E+04	1202	0.
10	8.23E+06	108	4.04E+04	1481	0.
12	8.31E+06	128	3.35E+04	1760	0.
14	8.04E+06	148	2.82E+04	2039	0.
16	7.35E+06	169	2.48E+04	2318	0.
18	7.09E+06	189	1.88E+04	2597	0.
20	5.56E+06	209	1.48E+04	2876	0.
22	5.79E+06	230	1.14E+04	3155	0.
24	5.30E+06	250	9.41E+03	3434	0.
26	4.59E+06	271	7.41E+03	3713	0.
28	3.90E+06	291	5.83E+03	3992	0.
30	3.17E+06	311	3.58E+03	4271	0.
TOTALS					
LWC	5.84E-04		1.46E-03		1.44E-04
MED D	24		98		181

PRESS (MB) 458.06
ALT (KM) 6.21
T -31.86C
FPT -34.5C
TAS (M/S) 196.45
Z 4.26E-03
FORM F .49
NT(N/M**3) 9.0434E+03
TOTALS 1.61E-03 92

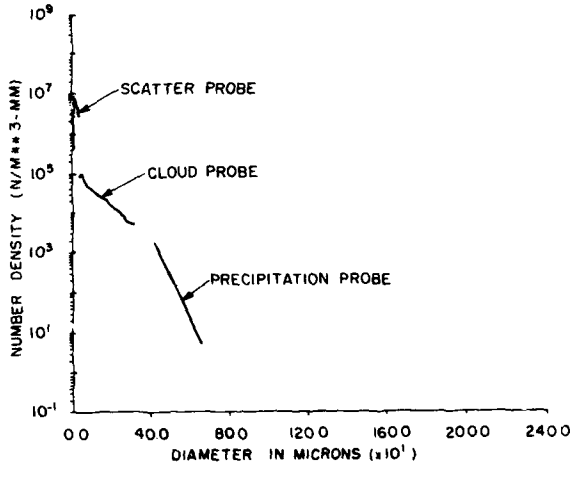


Figure 47. Particle Distribution: 5 February 1806-1811Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 ON 05 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 18:38:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.96E+08	26	2.08E+04	413	6.68E+02
4	3.82E+08	47	3.91E+04	644	4.91E+01
6	1.27E+08	67	1.67E+04	923	1.12E+00
8	1.04E+07	87	1.10E+04	1202	8.37E-02
10	7.11E+06	108	5.72E+03	1481	0.
12	6.77E+06	128	4.37E+03	1760	0.
14	6.46E+06	148	4.07E+03	2039	0.
16	5.56E+06	169	2.46E+03	2318	0.
18	5.68E+06	189	3.42E+03	2597	0.
20	4.19E+06	209	2.55E+03	2876	0.
22	3.92E+06	230	3.04E+03	3155	0.
24	2.64E+06	250	3.90E+03	3434	0.
26	2.57E+06	271	3.24E+03	3713	0.
28	1.38E+06	291	2.63E+03	3992	0.
30	1.09E+06	311	2.09E+03	4271	0.
LWC	4.01E-04		4.09E-04		5.55E-04
MED D	20		109		199

PRESS (MB) 460.65
ALT (KM) 6.17
T -29.54C
FPT -28.6C
TAS (M/S) 107.25
Z 1.42E-02
FORM F .32
NT(N/M**3) 2.2780E+03
TOTALS 9.64E-04 156

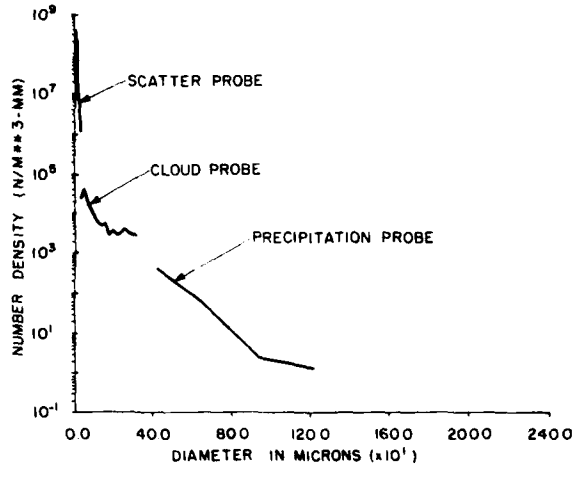


Figure 48. Particle Distribution: 5 February 1838-1842Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 GM 05 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 19:12:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	5.19E+05	26	1.05E+05	413	1.01E+00
4	3.41E+06	47	1.77E+05	644	0.
6	6.57E+06	67	1.20E+05	923	0.
8	9.35E+06	87	6.42E+04	1202	0.
10	8.54E+06	108	4.71E+04	1481	0.
12	7.36E+06	128	3.27E+04	1760	0.
14	6.43E+06	148	2.33E+04	2039	0.
16	6.02E+06	169	1.71E+04	2318	0.
18	5.71E+06	189	1.17E+04	2597	0.
20	4.81E+06	209	7.95E+03	2876	0.
22	4.45E+06	230	5.03E+03	3155	0.
24	4.70E+06	250	4.00E+03	3434	0.
26	4.16E+06	271	2.69E+03	3713	0.
28	2.59E+06	291	1.81E+03	3992	0.
30	2.44E+06	311	1.22E+03	4271	0.
LWC	4.76E-04		1.03E-03		5.78E-07
MED D	24		71		181

PRESS (MB) 425.32
ALT (KM) 6.75
T -31.03C
FPT -31.4C
TAS (M/S) 112.06
Z 1.19E-03
FORM F .56
NT(N/M**3) 1.0513E+04
TOTALS 1.03E-03 71

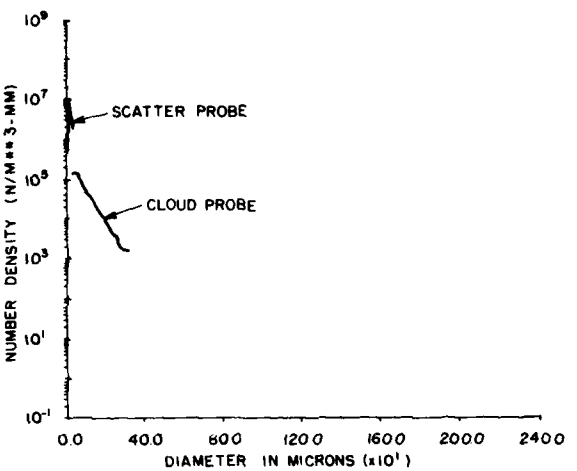


Figure 49. Particle Distribution: 5 February 1912-1917Z

REPRESENTATIVE PMS
2 D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 ON 05 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 19:32:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	7.51E+05	26	3.69E+05	413	7.94E-01
4	5.24E+06	47	4.25E+05	644	0.
6	8.09E+06	67	2.63E+05	923	0.
8	1.52E+07	87	1.81E+05	1202	0.
10	2.12E+07	108	1.46E+05	1481	0.
12	1.88E+07	128	1.12E+05	1760	0.
14	1.41E+07	148	7.41E+04	2039	0.
16	1.45E+07	169	5.80E+04	2318	0.
18	1.44E+07	189	4.35E+04	2597	0.
20	1.25E+07	209	2.98E+04	2876	0.
22	1.34E+07	230	2.51E+04	3155	0.
24	1.25E+07	250	1.60E+04	3434	0.
26	1.10E+07	271	1.12E+04	3713	0.
28	8.81E+06	291	7.89E+03	3992	0.
30	7.18E+06	311	5.53E+03	4271	0.
LWC	1.32E-01		3.46E-03		4.54E-07
NEB #	24		77		181

PRESS (MB) 423.34
ALT (KM) 6.78
T -30.49C
FPT -30.3C
TAS (M/S) 110.55
Z 4.74E-03
FORM F .57
NT(N/M**3) 2.8469E+04
TOTALS 3.46E-03 77

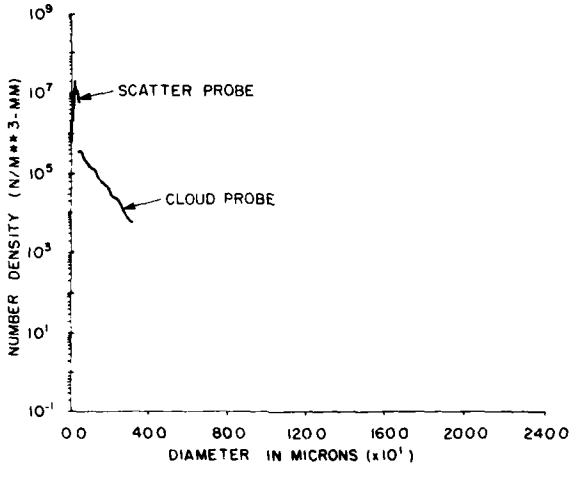


Figure 50. Particle Distribution: 5 February 1932-1937Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 ON 05 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 20:14:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	4.74E+05	26	3.70E+04	413	9.90E-02
4	1.51E+06	47	3.12E+04	644	0.
6	2.23E+06	67	2.09E+04	923	0.
8	1.79E+06	87	1.71E+04	1202	0.
10	1.57E+06	108	1.22E+04	1481	0.
12	1.42E+06	128	7.67E+03	1760	0.
14	8.15E+05	148	5.30E+03	2039	0.
16	9.14E+05	169	2.49E+03	2318	0.
18	7.85E+05	189	2.30E+03	2597	0.
20	9.16E+05	209	1.15E+03	2876	0.
22	8.17E+05	230	6.09E+02	3155	0.
24	1.07E+06	250	1.27E+02	3434	0.
26	5.98E+05	271	7.92E+01	3713	0.
28	7.25E+05	291	4.80E+01	3992	0.
30	4.73E+05	311	2.99E+01	4271	0.
LWC	9.11E-05		1.83E-04		5.46E-08
RED D	24		62		181

PRESS (MB) 401.01
ALT (KM) 7.14
T -32.57C
FPT -32.0C
TAS (M/S) 115.99
Z 1.22E-04
FORM F .67
NT(N/M**3) 2.2280E+03
TOTALS 1.83E-04 62

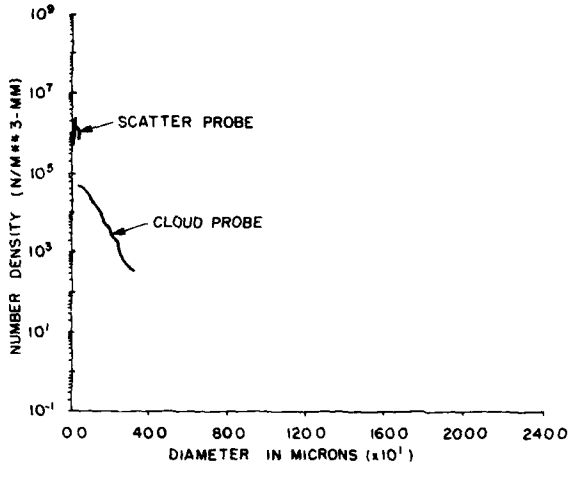


Figure 51. Particle Distribution: 5 February 2014-2019Z

REPRESENTATIVE PMS
2-D CLOUD PROBE
SHADOWGRAPHS

AFWL CIRRUS STUDY BY AFGL
FLIGHT E79-13 GH 05 FEB 79 301 SECOND AVERAGING
TYPE: BULL-ROSE INTERVAL START: 21:04:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	5.62E+05	26	8.47E+04	413	4.10E+02
4	2.19E+06	47	6.65E+04	644	1.13E-01
6	4.48E+06	67	2.74E+04	923	0.
8	9.43E+06	87	1.58E+04	1202	0.
10	1.00E+07	108	8.69E+03	1481	0.
12	7.73E+06	128	5.86E+03	1760	0.
14	6.57E+06	148	9.22E+03	2039	0.
16	5.43E+06	169	1.49E+04	2318	0.
18	6.18E+06	189	1.63E+04	2597	0.
20	4.33E+06	209	1.69E+04	2876	0.
22	4.05E+06	230	1.95E+04	3155	0.
24	3.22E+06	250	1.34E+04	3434	0.
26	2.86E+06	271	1.12E+04	3713	0.
28	2.22E+06	291	9.34E+03	3992	0.
30	1.87E+06	311	5.55E+03	4271	0.
					TOTALS
LWC	4.00E-04		1.43E-03		1.84E-04	1.61E-03
NEB N	23		106		181	110

PRESS (MB) 327.99

ALT (KM) 8.56

T -37.6C

FPT -37.0C

TAS (M/S) 132.12

Z 5.62E-03

FORM F .58

NT(N/M**3) 4.9579E+03

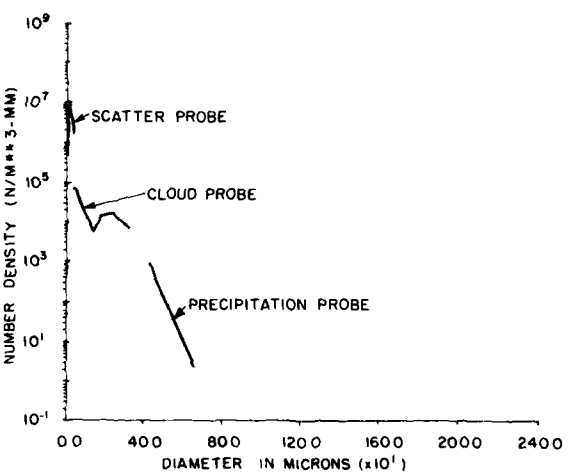


Figure 52. Particle Distribution: 5 February 2104-2109Z

5. As the airplane moved northeast, it entered an area of thin cirrus that was less closely associated with the front. Data taken over southern Missouri are displayed in Figure 51. The size range of the particles remains similar to that observed over Oklahoma, but the number of particles decreased. The median volume diameter dropped and the form factor rose. This indicates fewer particles of a more uniform, and generally smaller size. The cirrus here was more closely related to the upper air features than to the surface front. It may have originally been produced by the front, but if so, by this time it had lost most of the characteristics of frontal cirrus, resembling isolated jet stream cirrus.

6. The final data pass was taken near Nashville, Tennessee. It was in thin cirrostratus under another layer of cirrostratus. As Figure 52 shows, the number of particles in the lower channels of the cloud probe (20 to 200 μm) had remained similar to that of the last three data samples, but those in the higher channels of the cloud probe (200 to 400 μm) had increased. The result was a large increase in median volume diameter, a large increase in LWC, and a small decrease in form factor. The increase in 200- to 280-μm particles may have been the result of fall-out from the higher cloud layer. The altitude of this pass was 1.5 km (6000 ft) higher. As a result, the temperature was colder. The frontal surface was not in evidence, but the aircraft was in the midst of a band of strong winds. After leaving this area, the aircraft turned north and soon was in clear air.

6. CONCLUSIONS

This report has examined cirrus on three consecutive days in February 1979. In general, surface weather systems in the area were weak, although some surface weather boundaries were usually present. The upper air flow was dominated by southwesterly winds ahead of a long-wave trough. The resultant cirrus was thin. With very few exceptions, it was translucent, rarely obscuring the sky. When not in visible cloud, the aircraft often was in subvisible cirrus. There were periods during which the airplane was in clear air, with no data sensed by any of the probes.

The opacity of the cirrus seemed to be related to the number of particles in the 20- to 200-μm range. In cases of subvisible or barely visible cirrus, the number of particles in this range (the first 8 channels of the cloud probe) was generally 10^3 to 10^4 particles per channel in a 5-min average. In cases of visible cirrus, this figure was generally 10^4 to 10^6 particles per channel. An increase in the number of larger particles had a lesser effect on whether or not the cirrus was visible. In like manner, the opacity of visible cirrus was more closely related to the number of small particles rather than particle size.

Occasionally, the airplane flew beneath a deck of cirrostratus. During these times, there was an increase in the number of particles sensed. This was probably a result of larger ice crystals falling from the higher cloud layer. Often these distributions tended to have a greater number of large particles (500 μm or larger), as the smaller ones did not settle as rapidly, and sublimated faster.

7. ADDITIONAL COMMENT

All of the reports in this series of cirriform cloud studies have explored a variety of types, together with physical and microphysical properties as characterized. Particle spectra and liquid water content measurements for a cross section of visible and subvisible cirrus resulting from both frontal and nonfrontal cirrus are provided.

In their entirety, the reports have provided useful data. Beyond this objective, several observations have been noted in Section 6, as well as in corresponding sections of the other reports.

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Appendix A

3 February 1979 Data Tabulations

The data format used in the tabulations that follow is explained here. The date of the mission appears on the top line of each page. The comments provided are from the notes made during the flight by the Mission Director.

START TIME	Start time of sample. End was 14 sec later. Time in *UMT*.
ALT KM	Mean altitude of sample (km).
TEMP C	Mean temperature of sample (^{o}C).
LWC-SC	Liquid water content (in g/m^{3}) calculated over 2-27 μm range of the scattering probe.
G/M**3	Grams per cubic meter.
LWC-CP	Liquid water content (in g/m^{3}) calculated over 26-4700 μm range of cloud and precip probes.
LWC % CLD	Percent of total water content of the LWC-CP column determined from cloud probe only.
DO UM	Medium volume diameter of equivalently melted particles.
NT N/M**3	Particle number total per cubic meter over 47-4700 μm size range.
LMAX UM	Greatest size having > 1 particle m^{-3} mm^{-1} (in μm).
FF	Form factor (see text).

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-BC G/M**3	LWC-CP G/M**3	LWC CLD	BO UM	NT N/M**3	LMAX UM	FF	
18:00:47	1.6	3.1	0.00000	.00001	100	22.85	0.	26	0.00	
18:01:02	1.6	3.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:01:17	1.6	3.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:01:32	1.6	3.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:01:47	1.6	3.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:02:02	1.6	3.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:02:17	1.6	3.0	.00000	0.00000	0	0.00	0.	2	0.00	
18:02:32	1.6	3.1	.00000	0.00000	0	0.00	0.	3	0.00	
18:02:47	1.6	3.2	.00000	0.00000	0	0.00	0.	5	0.00	
18:03:02	1.6	3.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:03:17	1.6	3.3	.00000	0.00000	0	0.00	0.	3	0.00	
18:03:32	1.6	3.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:03:47	1.6	3.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:04:02	1.6	3.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:04:17	1.6	1.1	0.00000	0.00000	0	275.70	1.	644	.92	
18:04:32	1.5	.1	0.00000	.00001	87	65.63	68.	413	.57	
18:04:47	1.6	.0	0.00000	.00001	100	33.34	480.	47	1.00	Takeoff from Kirtland AFB, NM
18:05:02	1.6	-.5	.00000	0.00000	0	0.00	0.	14	0.00	
18:05:17	1.7	-1.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:05:32	1.8	-1.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:05:47	1.8	-2.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:06:02	1.9	-2.8	.00001	0.00000	0	0.00	0.	21	0.00	
18:06:17	2.0	-3.4	.00009	0.00000	0	0.00	0.	5	0.00	
18:06:32	2.0	-4.1	.00000	0.00000	0	0.00	0.	5	0.00	
18:06:47	2.1	-5.0	.00000	0.00000	0	0.00	0.	3	0.00	
18:07:02	2.3	-6.3	.00000	0.00000	0	0.00	0.	3	0.00	
18:07:17	2.4	-7.5	.00000	0.00000	0	275.70	2.	644	.92	
18:07:32	2.5	-8.8	.00000	0.00000	0	314.03	4.	923	.80	
18:07:47	2.6	-9.4	.00000	0.00000	0	307.37	4.	923	.81	
18:08:02	2.8	-10.7	0.00000	0.00000	0	275.70	3.	644	.92	
18:08:17	2.9	-11.1	.00000	0.00000	0	459.44	4.	1202	.68	
18:08:32	3.0	-12.0	.00000	0.00000	0	275.70	5.	644	.92	
18:08:47	3.2	-12.9	.00000	0.00000	0	469.03	3.	1202	.63	
18:09:02	3.3	-13.2	.00000	0.00000	0	600.32	3.	1481	.68	
18:09:17	3.4	-13.3	.00000	0.00000	0	437.00	4.	1202	.67	
18:09:32	3.5	-13.4	.00000	0.00000	0	477.92	6.	1202	.49	
18:09:47	3.6	-13.7	.00000	0.00000	0	0.00	0.	5	0.00	
18:10:02	3.8	-14.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:10:17	3.9	-15.8	.00000	0.00000	0	0.00	0.	3	0.00	
18:10:32	4.0	-16.3	.00000	0.00000	0	0.00	0.	3	0.00	
18:10:47	4.1	-16.7	.00000	0.00000	0	0.00	0.	3	0.00	
18:11:02	4.2	-17.1	.00000	0.00000	0	0.00	0.	5	0.00	
18:11:17	4.3	-17.5	.00000	0.00000	0	0.00	0.	3	0.00	

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START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	MD UM	NT N/M**3	LMAX UM	FF	
18:11:32	4.3	-18.0	.00000	0.00000	0	0.00	0.	5	0.00	
18:11:47	4.4	-18.6	.00000	0.00000	0	0.00	0.	3	0.00	
18:12:02	4.6	-19.4	.00000	0.00000	0	0.00	0.	3	0.00	Mostly blue sky. Some Ci above
18:12:17	4.7	-20.5	.00000	0.00000	0	0.00	0.	3	0.00	
18:12:32	4.8	-21.3	.00000	0.00000	0	0.00	0.	3	0.00	
18:12:47	4.8	-21.8	.00000	0.00000	0	0.00	0.	3	0.00	
18:13:02	4.9	-22.4	.00000	0.00000	0	0.00	0.	2	0.00	
18:13:17	5.0	-23.1	.00000	0.00000	0	0.00	0.	2	0.00	
18:13:32	5.0	-23.8	.00000	0.00000	0	0.00	0.	3	0.00	
18:13:47	5.1	-24.1	.00000	0.00000	0	0.00	0.	2	0.00	
18:14:02	5.2	-24.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:14:17	5.3	-25.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:14:32	5.4	-25.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:14:47	5.4	-26.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:15:02	5.5	-27.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:15:17	5.6	-27.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:15:32	5.7	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:15:47	5.7	-29.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:16:02	5.8	-29.6	.00000	0.00000	0	0.00	0.	12	0.00	
18:16:17	5.8	-30.1	.00026	.00044	100	68.49	4567.	311	.51	
18:16:32	5.9	-30.4	.00032	.00129	100	83.19	7430.	311	.66	
18:16:47	5.9	-30.6	.00113	.00657	99	114.81	13785.	413	.77	
18:17:02	6.0	-31.1	.00128	.00553	99	109.96	11910.	413	.80	
18:17:17	6.0	-31.4	.00030	.00168	99	128.24	2721.	413	.77	
18:17:32	6.1	-31.6	.00011	.00024	98	111.41	417.	413	.84	
18:17:47	6.1	-31.9	.00010	.00039	100	81.93	1523.	250	.86	
18:18:02	6.2	-32.3	.00010	.00002	100	68.74	123.	148	.99	
18:18:17	6.2	-32.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:18:32	6.3	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:18:47	6.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:19:02	6.4	-33.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:19:17	6.5	-34.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:19:32	6.5	-34.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:19:47	6.5	-34.8	0.00000	0.00000	0	0.00	0.	0	0.00	Will head into a brownish Ci layer in a minute
18:20:02	6.5	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:20:17	6.5	-35.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:20:32	6.5	-35.6	.00031	.00204	100	59.71	25913.	209	.78	Entering very thin layer
18:20:47	6.5	-35.8	.00260	.00785	99	66.26	79800.	413	.57	*Exit very thin layer*
18:21:02	6.5	-36.1	.00003	0.00000	0	0.00	0.	25	0.00	
18:21:17	6.5	-35.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:21:32	6.5	-35.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:21:47	6.5	-35.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:22:02	6.5	-35.5	0.00000	0.00000	0	0.00	0.	0	0.00	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	MD UM	NT N/M**3	LMAX UM	FF	
18:22:17	6.5	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:22:32	6.5	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:22:47	6.4	-34.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:23:02	6.4	-34.7	.00000	0.00000	0	0.00	0.	3	0.00	
18:23:17	6.4	-34.8	.00000	0.00000	0	0.00	0.	7	0.00	
18:23:32	6.4	-34.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:23:47	6.4	-35.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:24:02	6.4	-35.0	.00048	.00130	100	8..28	8934.	311	.58	
18:24:17	6.4	-35.1	.00015	.00016	100	83.10	670.	230	.84	
18:24:32	6.4	-35.0	.00002	.00002	100	38.04	694.	47	.94	
18:24:47	6.4	-34.9	.00001	.00002	100	61.99	300.	128	.82	
18:25:02	6.4	-34.7	0.00000	.00001	100	78.28	45.	169	1.00	
18:25:17	6.4	-34.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:25:32	6.4	-34.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:25:47	6.4	-34.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:26:02	6.4	-33.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:26:17	6.4	-33.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:26:32	6.4	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:26:47	6.4	-32.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:27:02	6.4	-33.1	0.00000	0.00000	0	0.00	0.	0	0.00	Will skim tops of Ci.
18:27:17	6.4	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:27:32	6.3	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:27:47	6.3	-32.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:28:02	6.2	-32.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:28:17	6.2	-32.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:28:32	6.2	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:28:47	6.2	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:29:02	6.2	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:29:17	6.1	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:29:32	6.1	-31.7	.00056	.00083	100	50.70	456.	108	.93	In or on top of very thin cloud.
18:29:47	6.1	-31.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:30:02	6.1	-31.6	.00000	0.00000	0	0.00	0.	3	0.00	
18:30:17	6.1	-31.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:30:32	6.1	-31.5	.00000	0.00000	0	0.00	0.	3	0.00	
18:30:47	6.1	-30.9	.00000	0.00000	0	0.00	0.	2	0.00	
18:31:02	6.0	-30.4	.00000	.00001	100	30.53	134.	87	1.00	
18:31:17	5.9	-30.0	.00000	0.00000	0	0.00	0.	12	0.00	
18:31:32	5.8	-29.4	.00000	.00023	100	134.00	194.	311	.99	Very thin. Vis - 50 mi, getting very small counts
18:31:47	5.8	-29.4	.00000	0.00000	0	0.00	0.	2	0.00	
18:32:02	5.8	-29.2	.00000	0.00000	0	0.00	0.	2	0.00	
18:32:17	5.8	-29.4	.00000	0.00000	0	0.00	0.	2	0.00	
18:32:32	5.8	-29.3	.00000	.00001	100	78.28	45.	169	1.00	
18:32:47	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLB	DO UM	NT N/M**3	LMAX UM	FF	
18:33:02	5.8	-29.2	.00000	0.00000	0	0.00	0.	2	0.00	
18:33:17	5.8	-29.3	.00000	0.00000	0	0.00	0.	2	0.00	
18:33:32	5.9	-29.6	.00000	0.00000	0	0.00	0.	3	0.00	
18:33:47	5.9	-29.6	.00000	0.00000	0	0.00	0.	3	0.00	
18:34:02	5.9	-29.7	.00000	0.00000	0	0.00	0.	2	0.00	
18:34:17	5.9	-29.7	.00090	0.00000	0	0.00	0.	12	0.00	
18:34:32	5.9	-29.3	.00007	0.00000	0	0.00	0.	9	0.00	
18:34:47	5.9	-29.5	.00025	.00001	100	50.53	133.	87	1.00	
18:35:02	5.9	-29.7	.00474	.00003	100	42.84	758.	148	.65	Should be in middle of the Ci band soon. 35° 14' 106° 48', 19,800'
18:35:17	5.9	-30.0	.00119	.00001	100	58.07	93.	108	1.00	
18:35:32	5.9	-30.0	.00030	0.00000	0	0.00	0.	12	0.00	Now out
18:35:47	5.9	-30.0	.00000	0.00000	0	0.00	0.	3	0.00	
18:36:02	5.9	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:36:17	5.9	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:36:32	5.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:36:47	5.9	-30.2	.00000	0.00000	0	0.00	0.	3	0.00	
18:37:02	5.9	-30.2	.00000	0.00000	0	0.00	0.	5	0.00	
18:37:17	5.9	-30.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:37:32	5.9	-30.1	.00000	0.00000	0	0.00	0.	3	0.00	
18:37:47	5.9	-30.0	.00000	0.00000	0	0.00	0.	5	0.00	Altitude 19,800 feet. A long, narrow brownish cloud is on our right.
18:38:02	5.8	-29.7	.00004	.00037	100	116.62	601.	311	.86	
18:38:17	5.8	-29.4	.00005	.00017	100	127.26	311.	311	.79	Much Cu below, but not a ceiling. Snow covered Mesa below.
18:38:32	5.8	-29.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:38:47	5.8	-29.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:39:02	5.8	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:39:17	5.8	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:39:32	5.8	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:39:47	5.9	-29.7	.00001	0.00000	0	0.00	0.	25	0.00	
18:40:02	5.9	-29.3	.00001	.00018	100	132.11	149.	311	.94	
18:40:17	5.9	-29.1	.00047	.00034	100	132.00	379.	311	.91	
18:40:32	5.8	-29.4	.00006	.00026	100	132.15	774.	311	.57	
18:40:47	5.9	-30.0	.00000	.00018	100	134.00	82.	311	.99	
18:41:02	5.9	-30.2	.00000	0.00000	0	0.00	0.	3	0.00	Very thin. Filaments above us. Hard to tell visually when we are
18:41:17	5.9	-30.5	.00002	.00018	100	111.18	464.	311	.76	in or out of it.
18:41:32	5.9	-30.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:41:47	6.0	-30.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:42:02	6.0	-31.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:42:17	6.0	-30.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:42:32	6.0	-30.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:42:47	6.0	-30.8	.00006	.00004	100	77.20	378.	189	.75	Filaments going by above us. Vis 75 mi. Ci all quadrants.
18:43:02	6.0	-30.7	.00003	.00004	100	83.40	185.	189	.89	
18:43:17	6.0	-30.9	.00009	.00042	100	115.14	1236.	311	.66	Good stuff. Very thin. Most is on top of us.
18:43:32	6.0	-31.1	.00091	.00170	99	118.90	2792.	413	.84	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:43:47	6.0	-31.3	.00031	.00190	99	117.76	3964.	413	.74	
18:44:02	6.0	-31.2	.00024	.00117	99	132.65	1436.	413	.87	
18:44:17	6.0	-31.2	.00005	.00007	100	60.69	695.	140	.86	
18:44:32	6.0	-31.0	.00004	.00016	100	83.36	734.	209	.88	
18:44:47	6.0	-31.1	.00014	.00065	100	109.53	1239.	311	.89	
18:45:02	6.0	-31.4	.00016	.00064	100	105.86	1317.	311	.86	
18:45:17	6.0	-31.4	.00018	.00089	100	112.32	2072.	311	.75	
18:45:32	6.0	-31.3	.00012	.00052	99	99.92	1866.	413	.71	
18:45:47	6.0	-30.9	.00002	.00030	100	128.87	601.	311	.73	
18:46:02	6.0	-30.9	.00006	.00024	100	94.03	538.	311	.85	
18:46:17	6.0	-30.9	.00009	.00050	100	107.26	937.	311	.91	
18:46:32	5.9	-30.7	.00012	.00052	100	100.53	1535.	311	.77	
18:46:47	5.9	-30.6	.00008	.00059	100	96.98	1502.	311	.87	
18:47:02	5.9	-30.2	.00008	.00031	100	103.08	602.	311	.89	
18:47:17	5.9	-30.4	.00001	.00003	100	100.88	55.	230	1.00	
18:47:32	5.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	Every once in a while can see fibers of Ci go by.
18:47:47	5.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:48:02	5.9	-30.4	0.00000	0.00000	0	0.00	0.	0	0.00	Approaching another brownish layer. Very slight shadow from the Ci band.
18:48:17	5.9	-30.4	.00001	0.00000	0	0.00	0.	27	0.00	
18:48:32	5.9	-30.5	.00008	.00038	98	128.28	394.	413	.94	
18:48:47	5.9	-30.7	.00035	.00209	99	132.52	2582.	413	.85	
18:49:02	5.9	-30.6	.00020	.00128	99	128.29	2662.	413	.71	
18:49:17	5.9	-30.6	.00007	.00010	100	97.99	258.	230	.94	
18:49:32	5.9	-30.5	.00009	.00061	100	117.10	968.	311	.86	
18:49:47	5.9	-30.3	.00030	.00147	100	129.79	2961.	311	.69	
18:50:02	5.9	-30.2	.00007	.00071	99	114.33	1367.	413	.79	
18:50:17	5.9	-30.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:50:32	5.9	-30.4	0.00000	0.00000	0	0.00	0.	0	0.00	Moving through the base of <u>very thin</u> brownish Ci Layer.
18:50:47	5.9	-29.9	.00001	.00025	100	133.73	602.	311	.56	
18:51:02	5.8	-29.2	.00003	0.00000	0	0.00	0.	27	0.00	
18:51:17	5.8	-28.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:51:32	5.8	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:51:47	5.7	-28.4	.00000	.00001	77	51.67	136.	413	.34	
18:52:02	5.7	-28.2	.00034	.00135	98	129.37	4264.	413	.58	
18:52:17	5.7	-27.8	.00007	.00047	99	120.29	1479.	413	.62	
18:52:32	5.7	-28.1	.00001	.00001	100	58.07	93.	100	1.00	
18:52:47	5.6	-27.7	.00000	.00004	100	70.43	642.	109	.61	
18:53:02	5.6	-27.5	.00007	.00031	99	100.09	1818.	413	.49	
18:53:17	5.6	-27.5	.00016	.00052	98	105.06	2819.	413	.54	
18:53:32	5.6	-27.4	.00019	.00070	98	102.38	2434.	413	.69	
18:53:47	5.6	-27.2	.00002	.00003	100	100.88	56.	230	1.00	
18:54:02	5.6	-27.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:54:17	5.6	-27.5	0.00000	0.00000	0	0.00	0.	0	0.00	

03 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:54:32	5.7	-27.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:54:47	5.7	-27.8	.00000	.00001	100	58.07	89.	108	1.00	
18:55:02	5.7	-28.0	0.00000	.00003	100	72.41	576.	169	.57	Very thin cloud off to our right.
18:55:17	5.8	-28.9	.00014	.00055	97	122.11	1018.	413	.75	
18:55:32	5.8	-29.3	.00034	.00093	93	125.69	1899.	413	.69	Should be increasing counts now. Excellent vis; can see filaments going
18:55:47	5.9	-29.9	.00020	.00041	64	132.96	1739.	644	.46	by. Just a little haze in the air.
18:56:02	5.9	-29.6	.00010	.00031	78	113.56	1545.	644	.44	
18:56:17	5.8	-29.3	.00011	.00038	63	133.46	937.	644	.59	
18:56:32	5.8	-29.1	.00029	.00167	94	127.15	3203.	413	.71	
18:56:47	5.8	-28.8	.00059	.00267	92	128.99	6222.	413	.64	
18:57:02	5.8	-28.8	.00062	.00195	97	119.54	4894.	413	.66	
18:57:17	5.8	-28.7	.00011	.00043	69	128.51	1248.	644	.56	
18:57:32	5.8	-28.7	.00007	.00031	99	98.82	1036.	413	.70	Vis even better - might have passed out of the thin cloud.
18:57:47	5.7	-28.7	.00002	0.00000	0	0.00	0.	27	0.00	
18:58:02	5.7	-28.5	0.00000	0.00000	0	0.00	0.	0	0.00	Air seems very clear.
18:58:17	5.7	-27.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:58:32	5.7	-27.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:58:47	5.7	-27.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:59:02	5.7	-28.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:59:17	5.7	-28.4	0.00000	0.00000	0	0.00	0.	0	0.00	Should be getting back into the thin cloud soon.
18:59:32	5.8	-29.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:59:47	5.8	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:00:02	5.8	-29.2	.00001	0.00000	0	181.22	2.	413	1.00	
19:00:17	5.9	-29.4	.00002	.00006	56	103.18	262.	413	.53	
19:00:32	5.9	-29.5	.00007	.00002	20	170.78	337.	413	.32	Entering very thin brownish layer of Ci.
19:00:47	5.9	-29.6	.00019	.00019	67	126.77	830.	644	.45	
19:01:02	5.8	-29.4	.00055	.00105	70	131.76	2093.	644	.66	
19:01:17	5.8	-29.3	.00053	.00101	64	131.62	4607.	644	.44	
19:01:32	5.8	-29.5	.00037	.00215	95	124.19	3445.	413	.80	
19:01:47	5.8	-29.5	.00078	.00191	85	112.12	7037.	644	.55	Vis is down to ~ 20 mi, but still sunny.
19:02:02	5.8	-29.3	.00017	.00044	91	123.50	1478.	413	.56	
19:02:17	5.8	-29.3	.00006	.00045	94	130.31	672.	413	.78	
19:02:32	5.9	-29.4	.00003	.00023	99	106.48	530.	413	.88	
19:02:47	5.9	-29.6	.00012	.00008	100	93.02	197.	230	.96	
19:03:02	5.9	-29.7	.00001	.00004	96	109.94	62.	413	.96	
19:03:17	5.9	-29.6	.00007	.00001	60	60.41	90.	644	.20	
19:03:32	5.8	-29.5	.00005	.00010	91	104.43	432.	413	.61	
19:03:47	5.9	-29.5	.00066	.00218	94	125.23	5201.	413	.66	Very thin. Hard to tell base. No shadow on ground. Will climb 1000 feet
19:04:02	5.8	-29.4	.00016	.00108	97	113.92	2686.	413	.79	to get into it.
19:04:17	5.8	-29.3	.00006	.00036	87	133.85	1187.	413	.52	
19:04:32	5.8	-29.3	.00006	.00012	42	153.58	776.	644	.35	
19:04:47	5.8	-29.5	.00002	.00002	79	77.04	113.	413	.54	
19:05:02	5.9	-30.0	.00008	.00005	64	101.72	576.	644	.19	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:05:17	6.0	-30.4	.00025	.00091	64	120.88	1895.	644	.64	
19:05:32	6.0	-30.9	.00061	.00267	98	115.75	5752.	413	.75	
19:05:47	6.1	-31.1	.00042	.00260	99	126.66	6188.	413	.65	
19:06:02	6.1	-31.6	.00007	.00031	99	100.22	1296.	413	.65	
19:06:17	6.1	-31.7	.00084	.00175	100	45.81	39850.	230	.74	
19:06:32	6.1	-31.9	.00265	.00357	100	45.34	72993.	230	.80	
19:06:47	6.1	-31.8	.00058	.00093	100	38.65	22880.	148	.97	
19:07:02	6.2	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:07:17	6.2	-32.1	0.00000	0.00000	0	0.00	0.	0	0.00	
19:07:32	6.2	-32.0	.00000	.00003	100	82.07	101.	189	.97	
19:07:47	6.1	-32.0	.00001	.00009	100	84.37	277.	209	.99	
19:08:02	6.2	-32.1	.00004	.00007	100	64.78	747.	209	.68	
19:08:17	6.2	-32.5	.00016	.00013	100	70.98	1727.	209	.63	
19:08:32	6.2	-32.6	.00005	.00019	100	117.93	1113.	311	.47	Very thin cloud now. Good. Should be in and out for awhile.
19:08:47	6.2	-32.9	.00002	.00003	73	102.46	61.	413	.75	
19:09:02	6.2	-33.2	.00004	.00012	91	133.34	263.	413	.63	
19:09:17	6.2	-33.0	.00029	.00076	65	130.75	2673.	644	.50	
19:09:32	6.2	-32.9	.00077	.00113	56	134.46	4605.	644	.45	
19:09:47	6.2	-32.9	.00018	.00055	82	126.31	2298.	413	.48	
19:10:02	6.2	-32.8	.00004	.00019	97	110.71	536.	413	.72	
19:10:17	6.2	-32.9	.00009	.00050	99	128.77	976.	413	.74	Going along a band. Clr to rt. cloud on left.
19:10:32	6.2	-33.0	.00144	.00657	86	119.18	21827.	644	.57	
19:10:47	6.2	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:11:02	6.2	-33.0	.00007	.00022	81	129.51	2005.	413	.33	
19:11:17	6.2	-32.7	.00015	.00039	55	128.32	2109.	923	.20	
19:11:32	6.2	-32.8	.00006	.00020	97	124.01	256.	413	.89	Near base of a very thin layer.
19:11:47	6.2	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:12:02	6.2	-32.9	.00008	.00045	95	134.34	381.	413	.97	Generally out of most of it. Vis 100 mi.
19:12:17	6.2	-32.8	.00000	0.00000	0	0.00	0.	9	0.00	
19:12:32	6.2	-32.8	.00002	.00025	92	108.66	745.	413	.67	
19:12:47	6.2	-32.6	.00005	.00057	99	115.12	2113.	413	.59	
19:13:02	6.2	-32.6	.00012	.00004	97	78.84	436.	413	.68	
19:13:17	6.1	-32.2	.00000	.00012	100	132.60	215.	311	.72	
19:13:32	6.1	-31.8	0.00000	.00004	100	88.84	227.	209	.78	
19:13:47	6.1	-31.7	.00015	.00050	100	100.94	822.	311	.92	
19:14:02	6.1	-31.7	.00052	.00286	99	120.55	5796.	413	.75	
19:14:17	6.1	-31.9	.00013	.00120	100	111.15	2163.	311	.86	Very, very thin cloud, pass in and out quickly.
19:14:32	6.1	-32.1	.00015	.00104	100	108.52	2284.	311	.80	
19:14:47	6.1	-32.2	.00002	.00002	100	82.21	113.	189	.93	
19:15:02	6.1	-32.2	.00049	.00001	100	71.87	53.	148	1.00	Going through base of thin cloud now. Can see right through it.
19:15:17	6.1	-32.1	.00004	0.00000	0	0.00	0.	18	0.00	
19:15:32	6.1	-32.1	.00004	.00012	100	83.43	426.	250	.86	
19:15:47	6.1	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:16:02	6.1	-31.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:16:17	6.1	-31.7	0.00000	0.00000	0	0.00	0.	0	0.00	
19:16:32	6.1	-31.8	.00000	0.00000	0	0.00	0.	2	0.00	
19:16:47	6.1	-31.9	.00000	0.00000	0	0.00	0.	2	0.00	
19:17:02	6.1	-31.8	.00037	0.00000	0	0.00	0.	25	0.00	
19:17:17	6.1	-31.9	.00045	0.00000	0	0.00	0.	9	0.00	
19:17:32	6.1	-31.6	.00000	0.00000	0	0.00	0.	2	0.00	Must have just entered very, very thin layer.
19:17:47	6.1	-31.7	.00000	0.00000	0	0.00	0.	3	0.00	
19:18:02	6.1	-31.4	.00000	0.00000	0	0.00	0.	2	0.00	
19:18:17	6.1	-31.5	.00000	0.00000	0	0.00	0.	2	0.00	
19:18:32	6.1	-31.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:18:47	6.1	-31.5	.00000	0.00000	0	0.00	0.	5	0.00	
19:19:02	6.0	-31.2	.00000	.00008	100	70.85	547.	189	.91	Enter thin cloud again.
19:19:17	6.0	-31.5	.00013	0.00000	0	0.00	0.	11	0.00	
19:19:32	6.1	-32.0	.00074	0.00000	0	0.00	0.	12	0.00	
19:19:47	6.1	-32.0	.00000	0.00000	0	0.00	0.	7	0.00	
19:20:02	6.1	-31.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:20:17	6.1	-32.0	.00000	0.00000	0	0.00	0.	3	0.00	
19:20:32	6.1	-32.2	.00000	0.00000	0	0.00	0.	3	0.00	
19:20:47	6.1	-32.0	.00041	.00090	100	52.29	14302.	189	.82	
19:21:02	6.1	-31.8	.00025	.00087	100	52.54	15444.	148	.83	
19:21:17	6.1	-31.9	.00007	.00033	100	46.65	2251.	148	.86	Heavier. Brownish band on our left.
19:21:32	6.1	-32.1	.00008	.00006	100	48.04	1384.	128	.84	
19:21:47	6.1	-32.2	.00000	.00001	100	84.44	47.	189	1.00	
19:22:02	6.1	-32.2	.00004	.00024	100	73.65	1887.	230	.75	
19:22:17	6.1	-31.9	0.00000	.00002	100	91.96	51.	209	1.00	Very thin layer coming up straight ahead.
19:22:32	6.1	-31.9	.00012	.00047	100	79.69	2771.	230	.78	
19:22:47	6.1	-31.8	.00011	.00070	100	109.68	1374.	311	.86	
19:23:02	6.0	-31.5	.00007	.00036	100	85.75	1449.	230	.86	
19:23:17	6.0	-31.2	.00312	.00878	100	55.26	******	250	.70	
19:23:32	6.0	-31.2	.00007	.00015	100	75.25	1063.	250	.66	
19:23:47	6.0	-31.0	.00018	.00033	100	81.52	1865.	311	.58	
19:24:02	6.0	-30.8	.00032	.00100	96	123.66	2523.	413	.64	
19:24:17	6.0	-30.6	.00043	.00107	77	123.54	2863.	644	.61	
19:24:32	6.0	-30.7	.00036	.00085	73	127.14	2535.	644	.56	
19:24:47	6.0	-30.7	.00037	.00099	77	123.53	2792.	644	.59	
19:25:02	6.0	-30.7	.00017	.00024	85	133.82	587.	413	.60	
19:25:17	6.0	-30.7	.00033	.00040	64	133.55	1604.	644	.46	
19:25:32	6.0	-30.6	.00013	.00044	93	133.70	1785.	413	.46	
19:25:47	6.0	-30.7	.00010	.00001	31	142.42	100.	413	.37	
19:26:02	6.0	-30.9	.00001	.00015	99	132.97	198.	413	.84	In clear now. Only Cu topping at 19,000. Getting a few small counts.
19:26:17	6.0	-31.0	.00031	.00109	96	125.22	1898.	413	.76	
19:26:32	5.9	-30.2	0.00000	0.00000	0	0.00	0.	0	0.00	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC D/M**3	LWC-CP G/M**3	LWC CLB	DD UM	NT N/M**3	LMAX UM	FF
19:26:47	5.9	-29.9	.00001	0.00000	0	0.00	0.	19	0.00
19:27:02	5.9	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00
19:27:17	5.8	-29.2	0.00000	0.00000	0	0.00	0.	0	0.00
19:27:32	5.8	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00
19:27:47	5.8	-28.8	0.00000	0.00 [illegible]	0	0.00	0.	0	0.00
19:28:02	5.8	-28.9	0.00000	0.00000	0	0.00	0.	0	0.00
19:28:17	5.8	-29.0	0.00000	0.00000	0	0.00	0.	0	0.00
19:28:32	5.8	-29.0	.00000	0.00000	0	0.00	0.	12	0.00
19:28:47	5.8	-29.1	.00000	0.00000	0	0.00	0.	2	0.00
19:29:02	5.8	-29.2	.00000	0.00000	0	0.00	0.	3	0.00
19:29:17	5.8	-29.3	.00000	0.00000	0	0.00	0.	5	0.00
19:29:32	5.8	-29.5	.00000	0.00000	0	0.00	0.	3	0.00
19:29:47	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:30:02	5.8	-29.6	.00000	0.00000	0	0.00	0.	3	0.00
19:30:17	5.8	-29.5	.00000	0.00000	0	0.00	0.	3	0.00
19:30:32	5.8	-29.5	.00000	0.00000	0	0.00	0.	3	0.00
19:30:47	5.8	-29.5	.00000	0.00000	0	0.00	0.	3	0.00
19:31:02	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:31:17	5.8	-29.4	.00000	0.00000	0	0.00	0.	2	0.00
19:31:32	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:31:47	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:32:02	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:32:17	5.8	-29.4	.00000	0.00000	0	0.00	0.	3	0.00
19:32:32	5.8	-29.3	.00000	0.00000	0	0.00	0.	3	0.00
19:32:47	5.8	-29.1	.00000	0.00000	0	0.00	0.	3	0.00
19:33:02	5.8	-29.2	.00000	0.00000	0	0.00	0.	3	0.00
19:33:17	5.8	-28.9	.00000	0.00000	0	0.00	0.	3	0.00
19:33:32	5.8	-28.9	.00000	0.00000	0	0.00	0.	3	0.00
19:33:47	5.8	-29.0	.00000	0.00000	0	0.00	0.	3	0.00
19:34:02	5.8	-29.5	.00000	0.00000	0	0.00	0.	3	0.00
19:34:17	5.9	-29.9	.00000	0.00000	0	0.00	0.	3	0.00
19:34:32	5.9	-30.2	.00000	0.00000	0	0.00	0.	3	0.00
19:34:47	5.9	-30.3	.00000	0.00000	0	0.00	0.	3	0.00
19:35:02	5.9	-30.4	.00000	0.00000	0	0.00	0.	3	0.00
19:35:17	6.0	-30.4	.00000	0.00000	0	0.00	0.	3	0.00
19:35:32	6.0	-30.6	.00000	0.00000	0	0.00	0.	3	0.00
19:35:47	6.0	-30.6	.00000	0.00000	0	0.00	0.	9	0.00
19:36:02	6.0	-30.7	.00000	0.00000	0	0.00	0.	3	0.00
19:36:17	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00
19:36:32	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00
19:36:47	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00
19:37:02	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00
19:37:17	6.0	-31.0	.00001	0.00000	0	0.00	0.	21	0.00

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:37:32	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:37:47	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:38:02	6.0	-30.9	.00000	0.00000	0	0.00	0.	3	0.00	Much Cu below the Ci we're approaching. 20,100 feet.
19:38:17	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00	
19:38:32	6.0	-30.9	.00000	0.00000	0	0.00	0.	3	0.00	
19:38:47	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:39:02	5.9	-30.7	.00000	0.00000	0	0.00	0.	3	0.00	
19:39:17	5.9	-30.6	.00000	0.00000	0	0.00	0.	2	0.00	
19:39:32	5.9	-30.8	.00003	.00029	100	94.63	791.	230	.94	
19:39:47	5.9	-30.7	.00000	0.00000	0	0.00	0.	3	0.00	
19:40:02	5.9	-30.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:40:17	5.9	-30.6	.00000	.00002	100	78.28	87.	169	1.00	
19:40:32	5.9	-30.5	.00000	0.00000	0	0.00	0.	2	0.00	
19:40:47	5.9	-30.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:41:02	5.9	-30.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:41:17	5.9	-30.7	.00000	.00001	100	71.87	52.	148	1.00	
19:41:32	5.9	-30.7	.00000	.00003	100	90.06	118.	209	.89	
19:41:47	5.9	-30.7	.00000	0.00000	0	0.00	0.	2	0.00	
19:42:02	5.9	-30.8	.00000	.00001	100	78.28	43.	169	1.00	
19:42:17	6.0	-31.0	.00001	.00002	100	68.90	142.	148	.95	
19:42:32	6.0	-31.1	.00026	.00137	100	93.86	4667.	311	.72	
19:42:47	6.0	-31.1	.00026	.00148	100	102.94	4575.	311	.76	
19:43:02	6.0	-31.2	.00024	.00102	100	105.12	3121.	311	.71	In the middle of a 500 foot thick cirrus deck.
19:43:17	6.0	-31.3	.00143	.00051	100	89.44	2178.	250	.77	
19:43:32	6.0	-31.3	.00008	.00011	100	70.25	976.	189	.82	
19:43:47	6.0	-31.7	.00007	.00017	100	68.63	1434.	169	.85	
19:44:02	6.1	-31.8	.00001	.00001	100	65.15	64.	128	1.00	
19:44:17	6.1	-31.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:44:32	6.1	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:44:47	6.1	-32.1	.00000	0.00000	0	0.00	0.	3	0.00	
19:45:02	6.1	-32.2	.00020	.00008	100	41.37	2471.	128	.77	
19:45:17	6.1	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	In thin Ci layer now. The brown changes to white as we get closer.
19:45:32	6.1	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
19:45:47	6.1	-32.2	0.00000	0.00000	0	0.00	0.	0	0.00	Vis 100 mi.
19:46:02	6.1	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
19:46:17	6.2	-32.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:46:32	6.2	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:46:47	6.2	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:47:02	6.2	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:47:17	6.2	-32.9	.00000	0.00000	0	0.00	0.	2	0.00	
19:47:32	6.2	-32.8	.00000	0.00000	0	0.00	0.	2	0.00	
19:47:47	6.2	-32.8	.00000	0.00000	0	0.00	0.	2	0.00	In clear now, parallel to a Ci band
19:48:02	6.1	-32.7	.00000	0.00000	0	0.00	0.	2	0.00	

03 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DQ UN	NT N/M**3	LMAX UM	FF	
19:48:17	6.2	-32.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:48:32	6.2	-32.9	.00000	0.00000	0	0.00	0.	2	0.00	
19:48:47	6.2	-32.7	.00000	0.00000	0	0.00	0.	2	0.00	
19:49:02	6.1	-32.5	.00000	0.00000	0	0.00	0.	2	0.00	
19:49:17	6.1	-32.3	.00000	0.00000	0	0.00	0.	16	0.00	
19:49:32	6.1	-32.2	.00000	0.00000	0	0.00	0.	2	0.00	
19:49:47	6.1	-32.3	.00000	0.00000	0	0.00	0.	2	0.00	
19:50:02	6.1	-32.6	.00001	0.00000	0	0.00	0.	18	0.00	Should begin to get counts soon. Must be in it now. Fibrous elements going by.
19:50:17	6.1	-32.7	.00003	.00003	100	41.68	290.	128	1.29	
19:50:32	6.1	-32.3	.00001	.00002	100	46.62	351.	87	.97	
19:50:47	6.1	-32.3	.00000	0.00000	0	0.00	0.	2	0.00	
19:51:02	6.1	-31.9	.00210	.00014	100	41.27	2863.	108	1.08	
19:51:17	6.1	-32.1	.00000	.00001	100	42.38	223.	67	1.00	
19:51:32	6.0	-31.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:51:47	6.0	-31.7	.00000	0.00000	0	0.00	0.	3	0.00	
19:52:02	6.0	-31.4	.00000	0.00000	0	0.00	0.	2	0.00	
19:52:17	6.0	-31.1	.00000	0.00000	0	0.00	0.	2	0.00	
19:52:32	6.0	-31.1	.00000	0.00000	0	0.00	0.	2	0.00	
19:52:47	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00	
19:53:02	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00	
19:53:17	6.0	-30.8	.00000	0.00000	0	0.00	0.	3	0.00	
19:53:32	6.0	-30.9	.00000	0.00000	0	0.00	0.	3	0.00	In the Ci band. Near tops. Brownish Ci, horizontal vis low.
19:53:47	6.0	-31.0	.00000	0.00000	0	0.00	0.	3	0.00	
19:54:02	5.9	-30.8	.00015	0.00000	0	0.00	0.	14	0.00	Nothing on snowstick
19:54:17	5.9	-30.9	.00001	0.00000	0	0.00	0.	7	0.00	
19:54:32	5.9	-30.9	.00084	.00002	100	91.96	49.	209	1.00	
19:54:47	6.0	-30.9	.00216	.00002	100	38.00	604.	87	.83	
19:55:02	6.0	-31.1	.00040	.00001	100	58.07	93.	108	1.00	
19:55:17	6.0	-30.6	.00000	0.00000	0	0.00	0.	3	0.00	
19:55:32	6.0	-30.7	.00013	0.00000	0	0.00	0.	12	0.00	
19:55:47	6.0	-31.0	.00626	.00015	100	48.14	1798.	148	1.12	
19:56:02	6.0	-31.3	.00081	0.00000	0	0.00	0.	25	0.00	Skimming tops. Can see through to ground, but there's probably shadow on ground. Fibrous elements going by.
19:56:17	6.0	-31.2	.00080	.00004	100	38.07	1334.	87	.87	
19:56:32	6.0	-31.1	.00058	.00004	100	48.69	798.	108	.94	
19:56:47	6.0	-31.2	.00996	.00001	100	33.34	485.	47	1.00	
19:57:02	6.0	-31.1	.00667	.00005	100	47.36	880.	87	1.12	Occasionally go through a top that is higher than others.
19:57:17	5.9	-30.8	.00233	.00002	100	61.89	199.	128	.93	
19:57:32	6.0	-30.9	.00259	.00006	100	50.67	1469.	148	.74	Still skimming tops
19:57:47	6.0	-31.0	.00370	.00001	100	42.38	217.	67	1.00	
19:58:02	6.0	-30.9	.00759	.00004	100	41.97	1402.	87	.86	Still right on top. Not an even flat top, but sticks up in various places.
19:58:17	5.9	-30.7	.00117	.00001	100	50.53	127.	87	1.00	
19:58:32	6.0	-30.8	.00250	.00003	100	39.65	457.	67	1.56	Can see through to ground, but short range is 3 to 4 mi.
19:58:47	5.9	-30.6	.00014	0.00000	0	0.00	0.	9	0.00	

03 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLB	DD UM	NT N/M**3	LMAX UM	FF	
19:59:02	5.9	-30.4	.00105	.00001	100	42.38	222.	67	1.00	
19:59:17	5.9	-30.2	.00212	.00003	100	48.59	499.	87	.97	
19:59:32	5.9	-30.0	.00312	.00001	100	65.15	69.	128	1.00	
19:59:47	5.8	-29.7	.00000	0.00000	0	0.00	0.	3	0.00	
20:00:02	5.8	-28.9	.00438	.00002	100	91.96	52.	209	1.00	Very thin, but now getting thicker. Even at that the ground is bright
20:00:17	5.9	-29.6	.00992	.00011	100	60.87	877.	250	.63	below. Very near tops. Bright blue looking just above tops.
20:00:32	5.9	-30.4	.00165	0.00000	0	0.00	0.	23	0.00	
20:00:47	5.9	-30.8	.00749	.00001	100	58.07	87.	108	1.00	
20:01:02	5.9	-30.5	.00000	0.00000	0	0.00	0.	5	0.00	
20:01:17	5.9	-30.5	.00052	0.00000	0	0.00	0.	23	0.00	
20:01:32	5.9	-30.6	.00000	0.00000	0	0.00	0.	5	0.00	
20:01:47	5.9	-30.8	.00257	.00002	100	37.91	688.	47	.94	Still right near top of cirrostratus. The Cu below gives a shadow, but
20:02:02	5.9	-30.8	.00145	.00002	100	54.43	550.	108	.73	the cirrus doesn't.
20:02:17	5.9	-30.7	.01283	.00011	100	49.81	1980.	209	.66	
20:02:32	5.9	-30.2	.00092	.00192	100	47.30	40130.	209	.77	
20:02:47	5.9	-30.1	.00000	.00002	100	58.07	178.	108	1.00	
20:03:02	5.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
20:03:17	5.9	-30.5	.00214	.00001	100	58.07	87.	108	1.00	
20:03:32	5.9	-30.2	.00180	0.00000	0	0.00	0.	16	0.00	
20:03:47	5.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
20:04:02	5.9	-30.4	.00000	0.00000	0	0.00	0.	2	0.00	
20:04:17	5.9	-30.6	.00154	.00299	100	41.09	70145.	230	.88	
20:04:32	5.9	-30.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:04:47	5.9	-30.7	.00028	0.00000	0	0.00	0.	14	0.00	
20:05:02	5.9	-30.8	.00223	.00001	100	58.07	89.	108	1.00	Still going through tops of Cs, brownish.
20:05:17	5.9	-30.8	.00001	0.00000	0	0.00	0.	9	0.00	
20:05:32	6.0	-31.1	.00317	.00005	100	52.68	892.	128	.80	
20:05:47	6.0	-31.2	.00156	.00005	100	63.68	371.	148	.97	Now going into a band of brownish cloud
20:06:02	5.9	-31.0	0.00000	0.00000	0	0.00	0.	0	0.00	Now we have come out. Vis 100 mf
20:06:17	5.9	-30.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:06:32	5.8	-29.8	.00000	.00001	100	78.28	42.	149	1.00	
20:06:47	5.6	-28.5	.00025	.00076	99	114.25	2863.	413	.59	
20:07:02	5.4	-27.1	.00001	.00001	100	78.28	44.	149	1.00	
20:07:17	5.3	-26.0	0.00000	0.00000	0	0.00	0.	0	0.00	

Appendix B

4 February 1979 Data Tabulations

The format is the same as that used in Appendix A.

04 FEB '79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
21:02:15	9.3	-40.2	.00002	.00011	100	133.50	150.	311	.78	
21:02:30	9.3	-40.3	.00001	0.00000	0	0.00	0.	22	0.00	
21:02:45	9.4	-40.4	.00000	0.00000	0	0.00	0.	14	0.00	
21:03:00	9.4	-40.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:03:15	9.4	-40.5	.00002	.00004	100	58.89	430.	148	.86	Little tuft above us coming up. We'll get a piece of it.
21:03:30	9.4	-40.5	.00001	.00007	100	46.82	1268.	128	.91	
21:03:45	9.4	-40.6	.00000	.00001	100	22.85	0.	26	0.00	
21:04:00	9.4	-40.5	0.00000	0.00000	0	0.00	0.	0	0.00	A couple of hundred feet under a tuft. No particle count.
21:04:15	9.4	-40.6	0.00000	.00001	100	42.38	169.	67	1.00	
21:04:30	9.4	-40.5	0.00000	0.00000	0	0.00	0.	0	0.00	Out from under it. Still no particle count.
21:04:45	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:05:00	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:05:15	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:05:30	9.4	-40.7	0.00000	.00001	100	84.44	35.	189	1.00	
21:05:45	9.4	-40.7	.00001	0.00000	0	0.00	0.	20	0.00	
21:06:00	9.4	-40.7	.00002	.00021	100	133.74	216.	311	.90	
21:06:15	9.4	-40.7	.00102	.00284	84	120.12	8014.	644	.60	
21:06:30	9.4	-40.7	.00004	.00016	100	125.55	289.	311	.80	
21:06:45	9.4	-40.7	.00031	.00118	99	108.14	3859.	413	.66	
21:07:00	9.4	-40.7	.00056	.00210	83	113.91	5600.	644	.63	*Clear to right.* Thin tufts of Ci going by above. Getting some counts now.
21:07:15	9.4	-40.7	.00014	.00033	94	123.11	1663.	413	.49	
21:07:30	9.4	-40.7	.00025	.00117	99	113.38	2971.	413	.72	
21:07:45	9.4	-40.7	.00074	.00142	78	116.92	5360.	644	.52	
21:08:00	9.4	-40.8	.00013	.00044	99	97.27	3271.	413	.52	
21:08:15	9.4	-40.8	.00011	.00028	99	56.07	4220.	413	.75	
21:08:30	9.4	-40.9	.00006	.00004	100	50.66	492.	289	.64	
21:08:45	9.4	-40.9	.00000	.00001	100	46.65	266.	87	.97	
21:09:00	9.4	-40.9	.00000	0.00000	0	0.00	0.	8	0.00	
21:09:15	9.4	-40.9	.00003	.00004	100	70.41	605.	148	.70	
21:09:30	9.4	-40.9	.00001	.00005	100	76.46	612.	189	.64	
21:09:45	9.4	-40.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:10:00	9.4	-41.0	.00002	.00016	100	95.47	1138.	250	.58	
21:10:15	9.4	-41.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:10:30	9.4	-41.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:10:45	9.4	-40.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:11:00	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	Banking to left toward the heavy Ci.
21:11:15	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:11:30	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	Heavy Ci straight ahead, but we're continuing turn.
21:11:45	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:12:00	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:12:15	9.4	-40.8	.00000	.00001	100	65.15	99.	128	1.00	
21:12:30	9.4	-40.7	0.00000	.00001	100	71.87	39.	148	1.00	Can see tufts going by on its side. Small segments going by closer to us.
21:12:45	9.4	-40.7	.00011	.00039	100	68.93	3651.	230	.74	

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
21:13:00	9.4	-40.7	.00028	.00107	100	73.04	7867.	311	.60	Very thin segment coming up. Can see right through.
21:13:15	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:13:30	9.4	-40.6	0.00000	.00001	100	65.15	50.	128	1.00	Now out of it.
21:13:45	9.4	-40.5	0.00000	.00001	100	42.38	168.	67	1.00	
21:14:00	9.4	-40.4	.00000	0.00000	0	0.00	0.	12	0.00	In clear now.
21:14:15	9.4	-40.4	.00001	.00003	100	42.38	769.	188	.84	
21:14:30	9.4	-40.4	.00001	.00001	100	33.34	362.	47	1.00	
21:14:45	9.4	-40.4	.00001	.00002	100	58.87	273.	169	.76	
21:15:00	9.4	-40.4	.00001	.00001	100	58.87	69.	188	1.00	
21:15:15	9.4	-40.4	.00004	.00011	100	118.67	165.	311	.86	
21:15:30	9.4	-40.3	.00004	.00012	100	47.71	3505.	189	.74	
21:15:45	9.4	-40.3	.00005	.00020	100	85.77	1016.	311	.61	
21:16:00	9.4	-40.2	.00015	.00024	100	62.89	3313.	209	.79	
21:16:15	9.4	-39.8	.00027	.00055	100	58.91	8896.	209	.68	Going under some thin cloud. Hard to say how much higher it is. Probably
21:16:30	9.3	-39.7	0.00000	0.00000	0	0.00	0.	0	0.00	getting some fall-out. Some fibrous Ci 5000 feet below us.
21:16:45	9.3	-39.5	.00000	0.00000	0	0.00	0.	14	0.00	
21:17:00	9.3	-39.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:17:15	9.3	-39.5	.00001	.00016	100	108.91	977.	311	.50	
21:17:30	9.3	-39.6	.00037	.00090	99	96.83	3178.	413	.71	
21:17:45	9.3	-39.6	.00007	.00011	84	134.49	435.	413	.47	
21:18:00	9.3	-39.7	0.00000	.00001	100	65.15	52.	128	1.00	Can see more stuff going by above us.
21:18:15	9.3	-39.6	.00001	.00001	100	65.15	52.	128	1.00	
21:18:30	9.3	-39.7	.00002	.00002	100	35.79	917.	188	.75	
21:18:45	9.3	-39.8	0.00000	.00001	100	38.09	593.	67	.94	Seems to be Ci below - at least, ice crystal type.
21:19:00	9.3	-39.8	.00001	0.00000	0	0.00	0.	28	0.00	
21:19:15	9.3	-39.7	.00000	0.00000	0	0.00	0.	14	0.00	Still going under very thin tufts, probably not visible from ground at all.
21:19:30	9.3	-39.6	.00048	.00118	99	126.23	2438.	413	.72	
21:19:45	9.3	-39.6	.00004	.00014	100	125.95	432.	311	.63	
21:20:00	9.3	-39.5	.00004	.00282	100	101.81	9654.	311	.63	
21:20:15	9.3	-39.6	.00001	.00003	100	54.93	407.	128	.99	Clouds like tufts of thin cotton above us.
21:20:30	9.3	-39.4	.00001	.00005	100	51.85	883.	169	.74	Now only blue sky above us.
21:20:45	9.3	-39.2	.00002	.00002	100	61.87	127.	128	.99	
21:21:00	9.3	-39.5	.00005	.00004	100	45.03	859.	169	.68	
21:21:15	9.4	-40.1	.00003	.00017	100	134.00	144.	311	.99	
21:21:30	9.4	-40.1	.00000	.00001	100	38.07	547.	67	.94	
21:21:45	9.4	-40.3	.00001	.00008	100	92.86	309.	250	.79	Between layers predominantly.
21:22:00	9.4	-40.0	.00002	.00017	100	67.60	1140.	209	.71	
21:22:15	9.4	-39.9	.00004	.00009	100	46.56	3393.	128	.78	
21:22:30	9.3	-39.7	.00031	.00067	99	79.91	6974.	311	.47	
21:22:45	9.3	-39.7	.00056	.00172	99	94.15	9418.	413	.56	
21:23:00	9.3	-39.6	.00138	.00262	99	108.78	25308.	413	.64	
21:23:15	9.3	-39.6	.00089	.00263	99	114.92	9119.	413	.61	Now in lighter cloud. Good stuff. Can see blue sky under and over a
21:23:30	9.3	-39.7	.00025	.00049	100	81.57	3917.	330	.48	Ci band ahead. Will go under it soon.

04 FEB '79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
20:51:30	9.3	-42.2	0.00000	0.00000	0	0.00	0.	0	0.00	
20:51:45	9.3	-42.4	0.00000	0.00000	0	0.00	0.	0	0.00	Ci above and to the right.
20:52:00	9.3	-42.4	0.00000	0.00000	0	0.00	0.	0	0.00	
20:52:15	9.4	-42.4	0.00000	0.00000	0	0.00	0.	0	0.00	
20:52:30	9.4	-42.4	0.00000	0.00000	0	0.00	0.	0	0.00	
20:52:45	9.4	-42.3	0.00000	0.00000	0	0.00	0.	0	0.00	Hdg 045°, but in turn. No cloud ahead but Ci off to our right. Shadows below the Ci. It's 10 mi off to our right. The very thin good stuff is a couple thousand ft above us, but can't reach it.
20:53:00	9.3	-42.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:53:15	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00	
20:53:30	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00	
20:53:45	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00	
20:54:00	9.4	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00	
20:54:15	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00	
20:54:30	9.4	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00	
20:54:45	9.4	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00	
20:55:00	9.4	-41.8	0.00000	0.00000	0	0.00	0.	0	0.00	
20:55:15	9.4	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00	
20:55:30	9.4	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00	
20:55:45	9.4	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00	
20:56:00	9.4	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00	
20:56:15	9.4	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:56:30	9.4	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:56:45	9.4	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:57:00	9.4	-41.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:57:15	9.4	-41.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:57:30	9.4	-41.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:57:45	9.4	-41.4	.00000	0.00000	0	0.00	0.	2	0.00	
20:58:00	9.4	-41.4	0.00000	0.00000	0	0.00	0.	0	0.00	
20:58:15	9.4	-41.3	0.00000	0.00000	0	0.00	0.	0	0.00	
20:58:30	9.4	-41.3	0.00000	0.00000	0	0.00	0.	0	0.00	
20:58:45	9.4	-41.2	0.00000	0.00000	0	0.00	0.	0	0.00	
20:59:00	9.4	-41.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:59:15	9.4	-41.1	0.00000	0.00000	0	0.00	0.	0	0.00	In clear air now, with thin cloud on the right. Under thin cloud but approaching lower heavy band ahead.
20:59:30	9.4	-41.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:59:45	9.4	-41.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:00:00	9.4	-41.0	.00000	0.00000	0	0.00	0.	2	0.00	
21:00:15	9.4	-40.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:00:30	9.4	-40.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:00:45	9.4	-40.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:01:00	9.4	-40.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:01:15	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:01:30	9.4	-40.4	0.00000	.00001	100	71.87	39.	148	1.00	Tufts of thin cloud now. Looks like cotton.
21:01:45	9.3	-40.1	.00108	.00351	99	99.71	11541.	413	.73	
21:02:00	9.4	-40.2	.00080	.00291	100	120.36	4996.	311	.81	

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
20:40:45	9.0	-40.0	.00000	0.00000	0	0.00	0.	2	0.00
20:41:00	9.0	-40.1	.00000	0.00000	0	0.00	0.	2	0.00
20:41:15	9.0	-40.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:41:30	9.0	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:41:45	9.0	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:42:00	9.0	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:42:15	9.0	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:42:30	9.0	-39.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:42:45	9.1	-40.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:43:00	9.1	-40.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:43:15	9.2	-41.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:43:30	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:43:45	9.3	-41.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:00	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:15	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:30	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:45	9.3	-42.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:45:00	9.3	-42.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:45:15	9.3	-42.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:45:30	9.3	-42.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:45:45	9.3	-42.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:00	9.3	-42.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:15	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:30	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:45	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:00	9.3	-42.0	.00000	0.00000	0	0.00	0.	2	0.00
20:47:15	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:30	9.3	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:45	9.3	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:00	9.3	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:15	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:30	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:45	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:00	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:15	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:30	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:45	9.3	-41.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:00	9.3	-41.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:15	9.3	-41.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:30	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:45	9.3	-41.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:51:00	9.3	-42.0	0.00000	0.00000	0	0.00	0.	0	0.00
[illegible]	[illegible]	-42.1	0.00000	0.00000	0	0.00	0.	0	0.00

Over Roswell 30,200', Ci close to us - maybe 1000' above us. Running along a band of Ci to our left.

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
20:30:00	8.2	-36.7	.00000	0.00000	0	0.00	0.	4	0.00
20:30:15	8.3	-37.2	.00000	0.00000	0	0.00	0.	4	0.00
20:30:30	8.3	-37.3	.00000	0.00000	0	0.00	0.	2	0.00
20:30:45	8.3	-37.3	.00000	0.00000	0	0.00	0.	2	0.00
20:31:00	8.4	-37.4	.00000	0.00000	0	0.00	0.	4	0.00
20:31:15	8.4	-37.4	.00000	0.00000	0	0.00	0.	2	0.00
20:31:30	8.4	-37.7	.00000	0.00000	0	0.00	0.	6	0.00
20:31:45	8.5	-38.0	.00000	0.00000	0	0.00	0.	4	0.00
20:32:00	8.5	-38.1	.00000	0.00000	0	0.00	0.	4	0.00
20:32:15	8.5	-38.3	.00000	0.00000	0	0.00	0.	4	0.00
20:32:30	8.5	-38.4	.00000	0.00000	0	0.00	0.	4	0.00
20:32:45	8.5	-38.6	.00000	0.00000	0	0.00	0.	4	0.00
20:33:00	8.6	-38.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:33:15	8.6	-38.3	0.00000	.00001	100	38.00	550.	67	.94
20:33:30	8.6	-38.0	.00000	.00002	100	56.33	314.	100	.91
20:33:45	8.6	-37.8	.00000	.00001	100	50.53	103.	87	1.00
20:34:00	8.6	-37.8	.00000	.00001	100	38.11	471.	87	.83
20:34:15	8.7	-38.0	.00000	0.00000	0	0.00	0.	4	0.00
20:34:30	8.7	-38.3	.00000	0.00000	0	0.00	0.	2	0.00
20:34:45	8.7	-38.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:00	8.7	-38.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:15	8.7	-38.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:30	8.8	-39.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:45	8.8	-39.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:36:00	8.8	-39.4	0.00000	0.00000	0	0.00	0.	0	0.00
20:36:15	8.8	-39.3	0.00000	.00001	100	61.85	122.	128	.99
20:36:30	8.8	-39.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:36:45	8.8	-39.4	0.00000	.00001	100	50.53	103.	87	1.00
20:37:00	8.8	-39.3	0.00000	.00002	100	50.53	307.	87	1.00
20:37:15	8.9	-39.4	0.00000	0.00000	0	0.00	0.	0	0.00
20:37:30	8.9	-39.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:37:45	8.9	-39.4	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:00	8.9	-39.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:15	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:30	9.0	-39.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:45	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:00	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:15	9.0	-39.8	.00000	0.00000	0	0.00	0.	2	0.00
20:39:30	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:45	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:00	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:15	9.0	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:30	9.0	-40.0	0.00000	0.00000	0	0.00	0.	0	0.00

27,000 feet. Getting closer to Ci, but it's still far away. Scattered Cu below.

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT #/M**3	LMAX UM	FF	
21:23:45	9.3	-39.8	.00014	.00035	100	88.95	3038.	311	.49	
21:24:00	9.4	-39.9	.00004	.00006	100	58.22	1203.	189	.60	
21:24:15	9.4	-39.9	.00011	.00021	100	75.92	1281.	209	.83	
21:24:30	9.4	-39.9	.00042	.00096	100	69.22	11897.	250	.62	
21:24:45	9.4	-39.9	.00003	.00010	100	73.16	636.	230	.79	
21:25:00	9.4	-39.9	.00002	.00009	100	69.73	549.	250	.71	
21:25:15	9.3	-39.7	.00033	.00071	100	81.42	4856.	311	.64	
21:25:30	9.3	-39.6	.00059	.00156	100	79.96	9374.	311	.69	
21:25:45	9.3	-39.6	.00068	.00205	100	81.04	13394.	311	.64	Many white tufts drifting by over us.
21:26:00	9.3	-39.6	.00143	.00444	100	68.63	42585.	311	.68	
21:26:15	9.3	-39.8	.00145	.00372	100	66.46	38113.	311	.69	Very thin stuff; no texture.
21:26:30	9.3	-39.9	.00053	.00105	100	49.00	20268.	209	.78	
21:26:45	9.3	-39.9	.00004	.00008	100	93.20	548.	250	.58	
21:27:00	9.3	-40.0	.00001	.00001	100	54.43	429.	108	.73	
21:27:15	9.3	-40.0	0.00000	.00001	100	78.28	33.	169	1.00	
21:27:30	9.3	-40.0	.00001	0.00000	0	0.00	0.	24	0.00	
21:27:45	9.3	-40.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:28:00	9.3	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00	
21:28:15	9.3	-40.2	0.00000	.00001	100	58.87	68.	108	1.00	
21:28:30	9.3	-40.3	.00038	.00113	98	120.49	2476.	413	.72	
21:28:45	9.3	-40.3	.00054	.00253	99	107.93	7817.	413	.68	
21:29:00	9.3	-40.4	.00181	.00668	99	111.42	19436.	413	.68	
21:29:15	9.3	-40.5	.00066	.00198	99	89.90	10407.	413	.58	Very thin stuff above us.
21:29:30	9.3	-40.5	.00009	.00023	100	53.05	4292.	230	.66	Going under a tuft in a minute.
21:29:45	9.3	-40.5	.00000	.00005	100	79.00	309.	230	.73	
21:30:00	9.3	-40.4	0.00000	.00005	100	96.43	445.	230	.58	Flying under a tuft now - or are we? primarily off our rt wing.
21:30:15	9.3	-40.4	.00002	.00002	100	90.21	205.	209	.60	
21:30:30	9.3	-40.4	.00003	.00001	100	42.38	167.	67	1.00	
21:30:45	9.3	-40.5	.00000	.00002	100	65.63	256.	148	.80	Mostly blue sky now, but a few filaments of Ci.
21:31:00	9.3	-40.5	0.00000	.00001	100	58.07	68.	108	1.00	
21:31:15	9.4	-40.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:31:30	9.4	-40.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:31:45	9.3	-40.4	.00001	0.00000	0	0.00	0.	24	0.00	
21:32:00	9.3	-40.1	.00013	.00001	100	33.34	354.	47	1.00	
21:32:15	9.3	-39.9	0.00000	.00002	100	100.00	42.	230	1.00	
21:32:30	9.3	-39.7	.00005	.00003	93	99.66	76.	413	.84	Going thru very thin Ci - at its base. Vis excellent. Sunny above,
21:32:45	9.3	-40.1	.00010	.00015	95	111.34	393.	413	.69	but the cloud is a type of virga. Very thin streaks in it.
21:33:00	9.3	-40.3	.00126	.00169	54	137.44	9135.	923	.38	
21:33:15	9.3	-40.2	.00211	.00451	69	126.67	16136.	644	.50	
21:33:30	9.3	-40.3	.00046	.00113	100	71.03	8857.	311	.69	
21:33:45	9.3	-39.2	.00001	0.00000	0	0.00	0.	18	0.00	Out of it.
21:34:00	9.3	-39.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:34:15	9.3	-35.4	0.00000	0.00000	0	0.00	0.	0	0.00	

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
21:34:30	9.3	-34.6	0.00000	0.00000	0	0.00	0.	0	0.00
21:34:45	9.3	-35.3	.00056	.00131	81	126.04	2619.	644	.70
21:35:00	9.3	-40.4	.00022	.00008	100	30.22	1579.	128	1.33
21:35:15	9.3	-40.4	0.00000	0.00000	0	0.00	0.	0	0.00
21:35:30	9.3	-40.3	0.00000	0.00000	0	0.00	0.	0	0.00
21:35:45	9.3	-40.3	.00001	.00001	100	65.15	54.	128	1.00
21:36:00	9.3	-40.2	0.00000	0.00000	0	0.00	0.	0	0.00
21:36:15	9.3	-40.1	.00001	.00001	100	22.85	0.	26	0.00
21:36:30	9.3	-40.1	.00003	.00003	100	36.85	594.	87	1.17
21:36:45	9.3	-40.1	.00002	.00003	100	37.01	557.	108	1.09
21:37:00	9.3	-40.1	.00003	.00003	100	46.82	532.	108	.93
21:37:15	9.3	-40.1	.00001	.00011	100	63.63	1480.	250	.51
21:37:30	9.3	-40.1	.00002	.00006	100	49.50	647.	189	.88
21:37:45	9.3	-39.9	.00001	.00005	100	57.25	867.	189	.63
21:38:00	9.3	-39.8	0.00000	.00001	100	42.38	173.	67	1.00
21:38:15	9.3	-39.9	0.00000	0.00000	0	0.00	0.	0	0.00
21:38:30	9.3	-40.0	0.00000	0.00000	0	0.00	0.	0	0.00
21:38:45	9.3	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:39:00	9.3	-40.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:39:15	9.3	-39.6	0.00000	0.00000	0	0.00	0.	0	0.00
21:39:30	9.2	-39.3	0.00000	0.00000	0	0.00	0.	0	0.00
21:39:45	9.3	-39.4	0.00000	0.00000	0	0.00	0.	0	0.00
21:40:00	9.3	-39.5	0.00000	0.00000	0	0.00	0.	0	0.00
21:40:15	9.3	-39.5	0.00000	0.00000	0	0.00	0.	0	0.00
21:40:30	9.3	-39.5	0.00000	0.00000	0	0.00	0.	0	0.00
21:40:45	9.3	-39.7	0.00000	0.00000	0	0.00	0.	0	0.00
21:41:00	9.3	-39.6	0.00000	0.00000	0	0.00	0.	0	0.00
21:41:15	9.3	-39.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:41:30	9.3	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:41:45	9.3	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:42:00	9.2	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:42:15	9.1	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:42:30	9.0	-37.3	0.00000	0.00000	0	0.00	0.	0	0.00
21:42:45	9.0	-37.0	.00000	0.00000	0	0.00	0.	2	0.00
21:43:00	8.9	-36.6	0.00000	0.00000	0	0.00	0.	0	0.00
21:43:15	8.9	-36.1	.00000	0.00000	0	0.00	0.	2	0.00
21:43:30	8.8	-35.6	.00000	0.00000	0	0.00	0.	2	0.00
21:43:45	8.7	-35.2	.00000	0.00000	0	0.00	0.	4	0.00
21:44:00	8.6	-34.7	.00000	0.00000	0	0.00	0.	4	0.00
21:44:15	8.6	-34.0	.00000	0.00000	0	0.00	0.	4	0.00
21:44:30	8.5	-34.2	.00000	0.00000	0	0.00	0.	4	0.00
21:44:45	8.4	-34.2	.00000	0.00000	0	0.00	0.	4	0.00
21:45:00	8.4	-33.9	.00000	0.00000	0	0.00	0.	4	0.00

No clouds to the right. On left Cs above, Ac below. Under Ci ceiling now. But only ~ 1000' thick. Sun bright through it.

Bit halo around sun; contrail goes through it.

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT M/M**3	LMAX UM	FF	
21:45:15	8.3	-33.7	.00000	0.00000	0	0.00	0.	2	0.00	
21:45:30	8.4	-33.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:45:45	8.4	-33.7	.00000	0.00000	0	0.00	0.	2	0.00	
21:46:00	8.3	-33.4	.00000	.00001	100	58.07	73.	100	1.00	Seem to be some fallstreaks below us.
21:46:15	8.3	-33.7	.00000	0.00000	0	0.00	0.	2	0.00	
21:46:30	8.4	-33.7	.00000	0.00000	0	0.00	0.	2	0.00	
21:46:45	8.3	-33.8	.00000	0.00000	0	0.00	0.	2	0.00	
21:47:00	8.3	-33.7	.00000	0.00000	0	0.00	0.	4	0.00	
21:47:15	8.3	-33.6	.00000	0.00000	0	0.00	0.	4	0.00	
21:47:30	8.3	-33.6	.00000	0.00000	0	0.00	0.	4	0.00	
21:47:45	8.3	-33.6	.00000	0.00000	0	0.00	0.	2	0.00	
21:48:00	8.3	-33.1	.00000	.00002	100	57.40	122.	128	1.55	
21:48:15	8.4	-33.2	.00000	.00001	100	58.53	216.	87	1.00	
21:48:30	8.4	-33.3	0.00000	.00001	100	58.07	74.	100	1.00	
21:48:45	8.3	-33.3	.00000	.00001	100	58.07	72.	100	1.00	
21:49:00	8.3	-33.3	0.00000	.00008	100	52.90	969.	128	.95	
21:49:15	8.3	-33.3	.00000	.00003	100	58.21	295.	128	.96	
21:49:30	8.3	-33.3	.00000	0.00000	0	0.00	0.	2	0.00	
21:49:45	8.2	-32.5	.00000	.00001	100	54.53	173.	100	.98	
21:50:00	8.1	-32.3	0.00000	.00001	100	58.53	105.	87	1.00	
21:50:15	8.0	-32.6	0.00000	.00001	100	58.07	71.	100	1.00	Still a halo around sun.
21:50:30	7.9	-31.5	.00000	0.00000	0	0.00	0.	4	0.00	
21:50:45	7.8	-31.2	.00000	0.00000	0	0.00	0.	4	0.00	
21:51:00	7.6	-30.9	.00000	0.00000	0	0.00	0.	4	0.00	
21:51:15	7.4	-30.3	.00000	0.00000	0	0.00	0.	4	0.00	
21:51:30	7.3	-29.5	.00000	0.00000	0	0.00	0.	4	0.00	
21:51:45	7.3	-29.7	.00000	0.00000	0	0.00	0.	4	0.00	
21:52:00	7.2	-30.0	.00000	0.00000	0	0.00	0.	4	0.00	
21:52:15	7.1	-29.9	.00000	.00001	100	58.07	71.	100	1.00	
21:52:30	6.9	-29.6	0.00000	.00003	100	56.98	318.	100	.98	
21:52:45	6.8	-29.2	0.00000	.00001	100	58.53	216.	87	1.00	
21:53:00	6.7	-28.6	.00000	.00001	100	33.34	390.	42	1.00	
21:53:15	6.6	-28.0	0.00000	.00003	100	54.49	377.	100	.98	
21:53:30	6.5	-27.5	0.00000	.00002	100	54.46	190.	100	.98	
21:53:45	6.5	-27.1	0.00000	.00002	100	54.53	188.	100	.98	
21:54:00	6.5	-27.2	.00000	0.00000	0	0.00	0.	2	0.00	
21:54:15	6.5	-27.3	.00000	0.00000	0	0.00	0.	4	0.00	
21:54:30	6.6	-27.6	.00000	0.00000	0	0.00	0.	4	0.00	
21:54:45	6.6	-27.8	0.00000	0.00000	0	0.00	0.	0	0.00	Not much sun anymore (covered by higher Cs)
21:55:00	6.6	-28.2	.00000	0.00000	0	0.00	0.	2	0.00	
21:55:15	6.7	-28.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:55:30	6.8	-29.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:55:45	6.8	-29.9	.00000	0.00000	0	0.00	0.	2	0.00	

04 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	N1 N/M**3	LMAX UM	FF	
21:56:00	6.8	-29.9	.00000	0.00000	0	0.00	0.	2	0.00	
21:56:15	6.8	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:56:30	6.8	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00	Going thru tops of heavy Ac. Banking to left.
21:56:45	6.7	-29.3	0.00000	0.00000	0	0.00	0.	0	0.00	
21:57:00	6.7	-29.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:57:15	6.6	-28.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:57:30	6.5	-27.7	.00000	0.00000	0	0.00	0.	4	0.00	
21:57:45	6.4	-27.2	.00001	0.00000	0	0.00	0.	16	0.00	
21:58:00	6.4	-26.7	.00000	0.00000	0	0.00	0.	2	0.00	
21:58:15	6.4	-26.4	.00000	0.00000	0	0.00	0.	10	0.00	
21:58:30	6.3	-25.8	.00000	0.00000	0	0.00	0.	10	0.00	
21:58:45	6.2	-25.4	.00019	.00037	46	147.59	1672.	644	.43	
21:59:00	6.2	-25.4	.00007	.00026	47	145.33	464.	644	.65	
21:59:15	6.2	-25.3	.00001	.00013	56	135.17	242.	644	.65	
21:59:30	6.3	-25.8	.00007	.00008	51	148.25	166.	644	.65	
21:59:45	6.3	-26.1	.00002	.00007	100	134.00	73.	311	.99	
22:00:00	6.3	-26.2	.00004	.00016	25	188.24	374.	644	.56	
22:00:15	6.3	-26.2	.00078	.00006	39	230.70	1269.	644	.13	Good. Just passed thru fallstreak
22:00:30	6.3	-26.1	0.00000	0.00000	0	0.00	0.	0	0.00	
22:00:45	6.2	-25.4	.00004	.00008	37	159.99	323.	644	.47	
22:01:00	6.1	-24.8	.00017	.00028	28	181.86	2182.	923	.29	
22:01:15	6.1	-24.4	.00157	.00021	1	451.06	3887.	1760	.22	
22:01:30	6.1	-24.3	.00081	.00031	13	275.12	2668.	1202	.23	Ahead and down can see 10 mi, but must be passing through haze.
22:01:45	6.1	-24.6	.00011	.00007	81	81.20	737.	644	.23	
22:02:00	6.2	-25.1	.00004	.00013	92	118.01	401.	413	.59	
22:02:15	6.2	-25.6	.00016	.00002	60	53.12	245.	644	.16	
22:02:30	6.2	-25.6	.00011	.00010	14	208.87	472.	923	.41	
22:02:45	6.2	-25.3	.00045	.00007	2	301.57	2051.	1202	.21	
22:03:00	6.2	-25.0	.00096	.00012	1	402.73	1286.	1760	.33	Sky very dark above. Can see thru thin stuff to ground.
22:03:15	6.2	-23.5	0.00000	0.00000	0	0.00	0.	0	0.00	
22:03:30	6.1	-24.2	0.00000	0.00000	0	0.00	0.	0	0.00	
22:03:45	6.1	-24.1	.00004	.00004	32	251.67	347.	923	.17	
22:04:00	6.1	-24.3	.00059	.00021	5	365.45	2466.	1202	.21	Briefly in a big cloud. Giant particles on 2-D display.
22:04:15	6.1	-24.6	.00004	0.00000	0	275.70	6.	644	.92	
22:04:30	6.2	-24.9	.00002	0.00000	0	181.22	2.	413	1.00	
22:04:45	6.2	-25.4	.00009	.00011	22	187.53	381.	644	.52	
22:05:00	6.2	-25.3	.00018	.00005	57	93.10	525.	644	.19	
22:05:15	6.2	-25.2	.00003	.00017	93	117.40	624.	413	.56	Blue sky to left. Dark cloud on right. Will go thru more fallstreaks.
22:05:30	6.2	-25.2	.00024	.00018	12	233.99	842.	1202	.34	
22:05:45	6.2	-24.6	.00126	.00023	10	250.77	1758.	1202	.31	Hard to tell when you're in the fallstreaks. Vis ahead ~ 10 mi. most of time
22:06:00	6.2	-24.7	.00142	.00015	43	154.06	556.	644	.42	
22:06:15	6.1	-24.6	.00007	.00021	60	132.89	268.	644	.81	
22:06:30	6.0	-23.7	.00011	.00025	45	148.11	935.	644	.48	

04 FEB 84 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	N1 N/M**3	LMAX UM	FF	
22:06:45	5.9	-23.1	.00017	.00014	34	244.60	1644.	923	.16	
22:07:00	5.9	-22.9	.00031	.00009	6	310.88	1133.	1202	.25	
22:07:15	5.9	-22.7	.00059	.00008	2	481.43	1822.	1760	.18	
22:07:30	5.9	-22.7	.00002	.00003	100	89.85	90.	209	.99	
22:07:45	5.9	-22.6	0.00000	0.00000	0	0.00	0.	0	0.00	
22:08:00	5.8	-22.5	.00004	0.00000	0	275.70	1.	644	.92	Very thin stuff just below us. I guess we're in the tops of As deck.
22:08:15	5.8	-22.4	.00004	.00003	95	90.40	479.	413	.38	
22:08:30	5.8	-22.3	.00007	0.00000	0	0.00	0.	14	0.00	
22:08:45	5.8	-22.3	.00075	0.00000	0	0.00	0.	14	0.00	In and out of thin stuff.
22:09:00	5.8	-21.8	.00009	0.00000	0	0.00	0.	10	0.00	
22:09:15	5.8	-21.7	.00416	0.00000	0	0.00	0.	14	0.00	
22:09:30	5.8	-21.7	.00616	0.00000	0	0.00	0.	14	0.00	
22:09:45	5.8	-21.4	.00000	0.00000	0	0.00	0.	2	0.00	Into thicker, foggy cloud - but out quickly.
22:10:00	5.8	-21.7	.00001	0.00000	0	0.00	0.	26	0.00	
22:10:15	5.8	-22.1	0.00000	0.00000	0	0.00	0.	0	0.00	
22:10:30	5.9	-22.3	0.00000	0.00000	0	0.00	0.	0	0.00	
22:10:45	5.9	-22.6	0.00000	0.00000	0	0.00	0.	0	0.00	
22:11:00	6.1	-23.6	0.00000	0.00000	0	0.00	0.	0	0.00	
22:11:15	6.1	-24.4	.00001	0.00000	0	0.00	0.	20	0.00	
22:11:30	6.2	-25.0	.00000	.00001	100	65.15	63.	128	1.00	
22:11:45	6.3	-25.6	.00000	.00002	100	75.49	103.	169	.96	
22:12:00	6.4	-26.3	0.00000	0.00000	0	0.00	0.	0	0.00	
22:12:15	6.3	-26.2	0.00000	0.00000	0	0.00	0.	0	0.00	
22:12:30	6.3	-25.7	.00064	.00001	100	33.34	436.	47	1.00	
22:12:45	6.2	-24.9	.00000	0.00000	0	0.00	0.	16	0.00	
22:13:00	6.2	-25.1	.00000	0.00000	0	0.00	0.	4	0.00	
22:13:15	6.3	-25.7	0.00000	.00004	100	99.27	92.	230	.95	
22:13:30	6.3	-26.1	0.00000	0.00000	4	0.00	0.	0	0.00	
22:13:45	6.4	-26.5	.00000	.00002	9	91.96	47.	209	1.00	
22:14:00	6.5	-27.0	.00003	.00001	100	33.34	444.	47	1.00	In and out of very thin As for a long time.
22:14:15	6.5	-27.2	.00002	0.00000	0	0.00	0.	28	0.00	
22:14:30	6.4	-26.9	.00006	.00002	100	54.50	190.	108	.98	
22:14:45	6.4	-26.4	.00258	0.00000	0	0.00	0.	14	0.00	
22:15:00	6.3	-26.0	0.00000	0.00000	0	181.22	1.	413	1.00	
22:15:15	6.2	-25.1	0.00000	.00003	83	91.11	92.	644	.42	
22:15:30	6.1	-24.4	0.00000	0.00000	0	181.22	1.	413	1.00	No longer under higher layers.
22:15:45	6.0	-23.5	.00000	.00001	56	53.50	121.	413	.29	
22:16:00	6.1	-23.7	0.00000	0.00000	0	0.00	0.	0	0.00	
22:16:15	6.1	-24.2	0.00000	.00001	100	50.53	126.	87	1.00	
22:16:30	6.2	-24.6	.00000	0.00000	0	0.00	0.	4	0.00	In hazy though relatively clear air.
22:16:45	6.1	-23.9	0.00000	.00001	100	58.07	79.	108	1.00	
22:17:00	6.0	-23.2	0.00000	.00001	100	58.07	79.	108	1.00	
22:17:15	6.0	-22.7	0.00000	.00003	100	54.56	395.	108	.98	

04 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
22:17:30	5.9	-22.2	0.00000	.00001	100	58.07	81.	100	1.00	
22:17:45	5.8	-21.5	0.00000	0.00000	0	0.00	0.	0	0.00	In hazy air, but not much cloud. The Ci is 10-15000' up. Can see grids
22:18:00	5.7	-20.8	.00000	0.00000	0	0.00	0.	2	0.00	of roads below
22:18:15	5.6	-20.2	0.00000	0.00000	0	0.00	0.	0	0.00	
22:18:30	5.6	-19.7	.00000	0.00000	0	0.00	0.	12	0.00	
22:18:45	5.5	-19.6	0.00000	0.00000	0	0.00	0.	0	0.00	
22:19:00	5.5	-19.5	0.00000	0.00000	0	0.00	0.	0	0.00	
22:19:15	5.5	-19.5	0.00000	0.00000	0	0.00	0.	0	0.00	Very hazy air.
22:19:30	5.5	-19.6	0.00000	.00001	100	58.07	85.	100	1.00	
22:19:45	5.5	-19.5	.00000	0.00000	0	0.00	0.	10	0.00	
22:20:00	5.5	-19.4	0.00000	.00001	100	58.07	82.	100	1.00	
22:20:15	5.5	-19.2	.00000	0.00000	0	0.00	0.	6	0.00	
22:20:30	5.5	-19.3	0.00000	0.00000	0	0.00	0.	0	0.00	
22:20:45	5.5	-19.3	0.00000	0.00000	0	0.00	0.	0	0.00	
22:21:00	5.5	-19.5	0.00000	0.00000	0	0.00	0.	0	0.00	
22:21:15	5.5	-19.5	0.00000	0.00000	0	0.00	0.	0	0.00	
22:21:30	5.6	-19.6	0.00000	0.00000	0	0.00	0.	0	0.00	
22:21:45	5.6	-19.7	.00000	0.00000	0	0.00	0.	4	0.00	
22:22:00	5.6	-19.9	0.00000	0.00000	0	0.00	0.	0	0.00	
22:22:15	5.6	-20.1	.00000	0.00000	0	0.00	0.	4	0.00	
22:22:30	5.6	-20.2	0.00000	0.00000	0	0.00	0.	0	0.00	
22:22:45	5.6	-20.3	.00000	0.00000	0	0.00	0.	4	0.00	Now out into blue sky again. Leaving cloudy air behind.
22:23:00	5.6	-20.5	.00000	0.00000	0	0.00	0.	4	0.00	
22:23:15	5.6	-20.6	.00000	0.00000	0	0.00	0.	6	0.00	
22:23:30	5.6	-20.6	.00000	0.00000	0	0.00	0.	4	0.00	
22:23:45	5.6	-20.4	.00000	.00001	100	58.53	87.	87	1.00	
22:24:00	5.6	-20.1	0.00000	.00001	100	58.53	84.	87	1.00	
22:24:15	5.6	-19.9	.00000	0.00000	0	0.00	0.	2	0.00	
22:24:30	5.6	-20.0	0.00000	0.00000	0	0.00	0.	0	0.00	
22:24:45	5.6	-20.3	0.00000	0.00000	0	0.00	0.	0	0.00	
22:25:00	5.6	-20.4	0.00000	0.00000	0	0.00	0.	0	0.00	
22:25:15	5.6	-20.4	.00000	0.00000	0	0.00	0.	4	0.00	
22:25:30	5.6	-20.5	.00000	0.00000	0	0.00	0.	4	0.00	
22:25:45	5.6	-20.6	.00000	0.00000	0	0.00	0.	2	0.00	
22:26:00	5.6	-20.7	.00000	0.00000	0	0.00	0.	2	0.00	
22:26:15	5.6	-20.8	.00000	0.00000	0	0.00	0.	2	0.00	
22:26:30	5.6	-20.7	.00000	0.00000	0	0.00	0.	4	0.00	
22:26:45	5.6	-20.8	0.00000	0.00000	0	0.00	0.	0	0.00	
22:27:00	5.6	-20.9	.00000	0.00000	0	0.00	0.	2	0.00	
22:27:15	5.6	-20.9	0.00000	0.00000	0	0.00	0.	0	0.00	
22:27:30	5.6	-20.8	0.00000	0.00000	0	0.00	0.	0	0.00	
22:27:45	5.6	-20.9	.00000	0.00000	0	0.00	0.	2	0.00	
22:28:00	5.6	-21.2	.00000	0.00000	0	0.00	0.	2	0.00	

Appendix C

5 February 1979 Data Tabulations

The format is the same as that used in Appendix A.

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
17:30:00	2.5	-7.5	.00000	0.00000	0	0.00	0.	4	0.00	
17:30:15	2.6	-7.7	.00000	0.00000	0	0.00	0.	4	0.00	
17:30:30	2.7	-8.0	.00000	.00001	100	33.34	432.	47	1.00	
17:30:45	2.8	-7.7	.00000	.00001	100	22.85	0.	26	0.00	
17:31:00	2.9	-8.3	.00004	.00004	100	49.15	791.	189	.59	
17:31:15	3.1	-9.0	.03391	.00027	77	113.86	1055.	644	.50	
17:31:30	3.2	-8.9	.02495	.00020	97	78.80	1513.	644	.49	
17:31:45	3.3	-8.8	.00005	.00002	80	57.62	365.	413	.35	
17:32:00	3.4	-8.5	.00005	.00014	54	113.38	808.	1202	.14	
17:32:15	3.5	-9.1	.00019	.00026	20	195.48	1179.	923	.33	
17:32:30	3.6	-9.9	.00031	.00028	30	175.62	1837.	1202	.16	
17:32:45	3.7	-10.1	.00010	.00011	51	104.91	1108.	1202	.11	
17:33:00	3.7	-10.7	.00051	.00131	33	172.63	7276.	1202	.24	
17:33:15	3.8	-11.2	.00203	.00137	14	293.25	10259.	2039	.14	
17:33:30	3.9	-11.9	.00103	.00080	6	340.67	8229.	2039	.15	
17:33:45	4.0	-12.5	.00203	.00082	4	442.07	10460.	2318	.14	
17:34:00	4.0	-12.9	.00407	.00142	3	497.65	16540.	3155	.14	
17:34:15	4.1	-13.3	.00509	.00214	4	435.87	28442.	3434	.11	
17:34:30	4.2	-13.9	.00163	.00088	13	263.42	7618.	1481	.23	Small snow on snowstick.
17:34:45	4.3	-14.4	.00232	.00143	7	343.93	13173.	3155	.11	
17:35:00	4.4	-15.2	.00428	.00146	3	413.93	19005.	2318	.17	
17:35:15	4.4	-16.0	.00595	.00216	3	431.95	29679.	2876	.13	
17:35:30	4.5	-16.8	.00621	.00276	4	452.37	28113.	4271	.00	
17:35:45	4.6	-17.5	.01482	.00839	4	582.14	86582.	3434	.13	
17:36:00	4.7	-18.0	.01004	.00386	3	422.59	48157.	2876	.16	
17:36:15	4.8	-18.6	.00374	.00183	9	287.48	18406.	1760	.20	
17:36:30	4.8	-18.9	.00172	.00096	20	205.78	7272.	1202	.25	
17:36:45	4.9	-19.1	.00090	.00078	35	164.82	4521.	923	.35	
17:37:00	4.9	-19.6	.00233	.00337	40	157.92	13557.	1202	.39	
17:37:15	5.0	-20.3	.00147	.00255	32	173.99	9574.	1202	.33	
17:37:30	5.1	-20.8	.00308	.00425	21	214.88	20954.	1760	.19	
17:37:45	5.1	-21.2	.00394	.00299	17	249.57	21942.	2597	.13	
17:38:00	5.2	-21.6	.00112	.00097	29	177.25	4898.	1481	.28	
17:38:15	5.2	-22.0	.00006	.00024	68	118.60	972.	644	.46	
17:38:30	5.3	-22.3	.00046	.00108	75	115.32	3373.	923	.50	
17:38:45	5.3	-22.8	.00010	.00007	98	69.97	561.	413	.70	
17:39:00	5.4	-23.4	.00003	.00001	100	58.07	76.	188	1.00	
17:39:15	5.5	-23.9	.00040	.00014	2	462.40	2335.	2039	.16	
17:39:30	5.5	-24.5	.00168	.00267	42	154.14	9400.	1202	.39	Getting into good thin cloud. Altitude 17,600 feet.
17:39:45	5.6	-25.1	.00025	.00088	83	111.12	3714.	644	.51	
17:40:00	5.6	-25.7	.00007	.00017	100	64.83	2040.	189	.65	
17:40:15	5.6	-25.2	0.00000	0.00000	0	0.00	0.	0	0.00	
17:40:30	5.6	-24.9	0.00000	0.00000	0	0.00	0.	0	0.00	

85 FEB [illegible] 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
17:40:45	5.5	-24.3	0.00000	0.00000	0	0.00	0.	0	0.00
17:41:00	5.5	-24.0	0.00000	0.00000	0	0.00	0.	0	0.00
17:41:15	5.4	-23.5	0.00000	0.00000	0	0.00	0.	0	0.00
17:41:30	5.4	-23.1	0.00000	0.00000	0	0.00	0.	0	0.00
17:41:45	5.3	-22.5	0.00000	0.00000	0	0.00	0.	0	0.00
17:42:00	5.3	-22.0	0.00000	0.00000	0	0.00	0.	0	0.00
17:42:15	5.2	-21.7	0.00000	0.00000	0	0.00	0.	0	0.00
17:42:30	5.2	-21.3	0.00000	0.00000	0	0.00	0.	0	0.00
17:42:45	5.2	-21.4	.00000	0.00000	0	0.00	0.	4	0.00
17:43:00	5.2	-21.6	0.00000	0.00000	0	0.00	0.	0	0.00
17:43:15	5.2	-21.8	0.00000	0.00000	0	0.00	0.	0	0.00
17:43:30	5.2	-21.8	0.00000	0.00000	0	0.00	0.	0	0.00
17:43:45	5.2	-21.8	.00000	0.00000	0	0.00	0.	0	0.00
17:44:00	5.2	-21.8	.00000	0.00000	0	0.00	0.	4	0.00
17:44:15	5.2	-21.9	0.00000	0.00000	0	0.00	0.	0	0.00
17:44:30	5.2	-21.7	0.00000	0.00000	0	0.00	0.	0	0.00
17:44:45	5.2	-21.7	.00000	.00001	100	22.85	0.	26	0.00
17:45:00	5.2	-21.9	0.00000	0.00000	0	0.00	0.	0	0.00
17:45:15	5.2	-22.1	0.00000	0.00000	0	0.00	0.	0	0.00
17:45:30	5.2	-22.2	.00000	0.00000	0	0.00	0.	6	0.00
17:45:45	5.3	-22.5	0.00000	0.00000	0	0.00	0.	0	0.00
17:46:00	5.2	-22.1	0.00000	0.00000	0	0.00	0.	0	0.00
17:46:15	5.2	-22.1	0.00000	0.00000	0	0.00	0.	0	0.00
17:46:30	5.2	-22.0	.00000	0.00000	0	0.00	0.	6	0.00
17:46:45	5.3	-22.1	.00000	0.00000	0	0.00	0.	4	0.00
17:47:00	5.2	-21.9	0.00000	0.00000	0	0.00	0.	0	0.00
17:47:15	5.2	-21.6	0.00000	0.00000	0	0.00	0.	0	0.00
17:47:30	5.2	-21.7	0.00000	0.00000	0	0.00	0.	0	0.00
17:47:45	5.3	-22.0	.00000	0.00000	0	0.00	0.	4	0.00
17:48:00	5.3	-22.2	.00000	0.00000	0	0.00	0.	4	0.00
17:48:15	5.4	-23.3	.00000	0.00000	0	0.00	0.	4	0.00
17:48:30	5.5	-23.9	.00000	0.00000	0	0.00	0.	10	0.00
17:48:45	5.5	-24.1	.00000	0.00000	0	0.00	0.	4	0.00
17:49:00	5.5	-24.3	0.00000	0.00000	0	0.00	0.	0	0.00
17:49:15	5.5	-24.3	.00000	0.00000	0	0.00	0.	4	0.00
17:49:30	5.5	-24.0	.00000	0.00000	0	0.00	0.	4	0.00
17:49:45	5.5	-24.1	.00000	0.00000	0	0.00	0.	4	0.00
17:50:00	5.5	-23.9	0.00000	0.00000	0	0.00	0.	0	0.00
17:50:15	5.5	-23.7	.00000	0.00000	0	0.00	0.	4	0.00
17:50:30	5.5	-23.6	.00000	0.00000	0	0.00	0.	2	0.00
17:50:45	5.5	-23.6	.00000	0.00000	0	0.00	0.	4	0.00
17:51:00	5.5	-23.8	.00000	0.00000	0	0.00	0.	4	0.00
17:51:15	5.5	-24.2	.00000	0.00000	0	0.00	0.	6	0.00

Seems like a long contrail type cloud to our left. Will go over and fly along it. It extends W-E.

In clear air, bright blue sky above.

05 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DO UM	NT N/M**3	LMAX UM	FF	
17:51:30	5.6	-24.7	.00000	0.00000	0	0.00	0.	2	0.00	
17:51:45	5.7	-25.2	.00000	0.00000	0	0.00	0.	2	0.00	
17:52:00	5.7	-25.4	.00000	0.00000	0	0.00	0.	4	0.00	Getting closer to the long W-E cloud, climbing.
17:52:15	5.7	-26.0	.00000	0.00000	0	0.00	0.	4	0.00	
17:52:30	5.8	-26.2	.00000	0.00000	0	0.00	0.	4	0.00	
17:52:45	5.8	-26.3	.00000	0.00000	0	0.00	0.	4	0.00	
17:53:00	5.9	-26.8	.00000	.00002	100	68.87	178.	148	.88	
17:53:15	6.0	-27.7	.00000	0.00000	0	0.00	0.	4	0.00	
17:53:30	6.0	-27.9	0.00000	0.00000	0	0.00	0.	0	0.00	
17:53:45	6.0	-28.4	.00001	0.00000	0	0.00	0.	26	0.00	
17:54:00	6.0	-28.5	.00006	.00001	100	50.53	122.	87	1.00	
17:54:15	6.0	-28.5	.00010	.00014	100	70.15	1462.	209	.70	
17:54:30	6.0	-28.5	.00020	.00058	99	64.31	6497.	413	.68	
17:54:45	6.1	-28.6	.00029	.00094	100	97.40	4937.	311	.60	
17:55:00	6.1	-28.9	.00010	.00059	99	99.53	3781.	413	.51	In clear air, banking to fly parallel to the cloud. Very thin cloud.
17:55:15	6.1	-28.9	.00001	.00001	100	33.34	437.	42	1.00	
17:55:30	6.1	-28.9	.00015	.00017	99	89.68	704.	413	.83	
17:55:45	6.1	-28.9	.00141	.00344	97	105.77	15005.	413	.58	
17:56:00	6.1	-28.8	.00038	.00091	100	75.87	8509.	311	.53	
17:56:15	6.1	-28.7	.00031	.00051	100	90.10	2895.	311	.63	
17:56:30	6.2	-29.7	.00025	.00074	99	107.57	4216.	413	.51	
17:56:45	6.2	-29.4	.00053	.00109	98	83.78	7616.	413	.56	
17:57:00	6.2	-29.9	.00008	.00014	100	74.42	1553.	230	.59	
17:57:15	6.3	-30.6	0.00000	0.00000	0	0.00	0.	0	0.00	
17:57:30	6.3	-30.8	0.00000	0.00000	0	0.00	0.	0	0.00	Can see blue sky thru the thin Ci cloud.
17:57:45	6.4	-31.1	0.00000	0.00000	0	0.00	0.	0	0.00	
17:58:00	6.4	-31.8	0.00000	.00001	100	50.07	85.	108	1.00	Little pieces of thin Ci all around us. Can see it most easily against
17:58:15	6.5	-32.2	0.00000	.00001	100	50.53	125.	87	1.00	blue sky.
17:58:30	6.5	-32.6	.00003	.00005	100	69.86	875.	209	.56	
17:58:45	6.5	-32.9	.00000	0.00000	0	0.00	0.	14	0.00	
17:59:00	6.5	-33.0	.00000	0.00000	0	0.00	0.	16	0.00	
17:59:15	6.5	-33.0	.00003	.00007	94	76.68	529.	413	.64	Heavier cloud, but still hard to tell when you're in it. Vis is excellent.
17:59:30	6.5	-32.9	.00036	.00096	97	110.83	3058.	413	.64	
17:59:45	6.5	-32.8	.00046	.00060	84	95.53	3014.	644	.50	
18:00:00	6.6	-33.1	.00054	.00126	97	90.24	7298.	413	.58	Still in thin Ci.
18:00:15	6.6	-33.2	.00027	.00076	99	84.57	4870.	413	.56	
18:00:30	6.6	-32.8	.00011	.00035	100	112.38	1645.	311	.54	
18:00:45	6.6	-33.4	.00002	.00004	100	88.37	338.	209	.65	
18:01:00	6.5	-33.0	.00087	.00295	99	98.09	14324.	413	.65	
18:01:15	6.5	-32.7	.00012	.00025	100	73.68	2535.	311	.41	
18:01:30	6.5	-32.6	.00011	.00018	97	65.89	844.	413	.46	Slightly less blue sky overhead. Probably getting a few pieces from above.
18:01:45	6.5	-32.8	.00049	.00144	86	93.93	8015.	644	.44	
18:02:00	6.4	-33.1	.00075	.00178	97	99.55	9447.	413	.54	Nothing below us. Ci doesn't cast a shadow on the ground.

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:02:15	6.4	-31.7	.00031	.00086	97	107.48	4067.	413	.55	
18:02:30	6.4	-31.6	.00021	.00017	100	78.87	1404.	230	.66	
18:02:45	6.4	-31.4	0.00000	0.00000	0	0.00	0.	0	0.00	
18:03:00	6.4	-31.3	0.00000	0.00000	0	0.00	0.	0	0.00	In clr air, but another piece coming soon.
18:03:15	6.4	-31.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:03:30	6.4	-31.3	.00002	.00001	100	42.38	201.	67	1.00	
18:03:45	6.4	-31.2	.00051	.00095	99	71.71	7385.	413	.52	
18:04:00	6.4	-31.2	0.00000	0.00000	0	0.00	0.	0	0.00	
18:04:15	6.4	-31.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:04:30	6.4	-31.3	.00009	.00018	100	77.98	2714.	311	.33	Vis excellent, but decreases ahead.
18:04:45	6.3	-30.9	.00020	.00052	100	70.94	4417.	311	.45	
18:05:00	6.3	-30.7	.00006	.00006	100	44.86	1501.	148	.72	
18:05:15	6.3	-30.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:05:30	6.3	-30.8	.00000	.00002	100	82.36	164.	189	.77	Another fibrous piece ahead. Blue sky everywhere
18:05:45	6.3	-30.7	.00005	.00017	100	119.09	1767.	311	.36	
18:06:00	6.3	-30.9	.00009	.00040	100	68.82	4706.	311	.46	
18:06:15	6.4	-31.0	.00049	.00079	100	67.25	8449.	311	.57	
18:06:30	6.4	-31.5	.00077	.00225	90	92.44	11201.	644	.54	
18:06:45	6.4	-31.5	.00021	.00053	100	72.02	5145.	230	.67	
18:07:00	6.4	-31.4	.00022	.00051	100	63.00	5954.	250	.59	Can see thin stuff going by against blue sky, just barely see it going by.
18:07:15	6.4	-31.4	.00038	.00077	99	79.98	6555.	413	.57	
18:07:30	6.4	-31.5	.00021	.00031	100	61.74	3955.	209	.75	
18:07:45	6.4	-31.6	.00038	.00051	100	59.47	5895.	250	.71	
18:08:00	6.5	-31.8	.00140	.00282	100	72.16	26566.	311	.60	
18:08:15	6.5	-32.4	.00115	.00269	99	80.97	21558.	413	.55	
18:08:30	6.5	-32.2	.00063	.00271	99	117.66	9678.	413	.60	
18:08:45	6.5	-32.4	.00051	.00160	82	115.60	7894.	644	.47	
18:09:00	6.5	-33.0	.00124	.00364	99	95.22	15819.	413	.63	Very thin Ci. Vis ahead ~ 10 mi. A little more restricted that direction
18:09:15	6.5	-32.6	.00110	.00330	88	109.77	11575.	644	.59	
18:09:30	6.5	-32.7	.00127	.00361	99	102.69	13732.	413	.64	
18:09:45	6.5	-32.8	.00050	.00112	99	104.61	4042.	413	.64	
18:10:00	6.5	-32.5	.00093	.00223	100	81.26	12992.	311	.61	
18:10:15	6.5	-32.6	.00003	0.00000	0	0.00	0.	28	0.00	
18:10:30	6.5	-32.5	.00002	.00015	100	68.79	2734.	250	.47	
18:10:45	6.6	-33.0	.00016	.00037	100	72.27	3042.	250	.67	
18:11:00	6.6	-33.8	.00001	.00008	100	90.74	413.	209	.74	
18:11:15	6.6	-34.0	.00004	.00008	100	71.91	636.	230	.69	
18:11:30	6.5	-33.1	0.00000	.00003	100	68.98	324.	148	.88	
18:11:45	6.4	-31.6	0.00000	0.00000	0	0.00	0.	0	0.00	
18:12:00	6.3	-30.7	0.00000	0.00000	0	0.00	0.	0	0.00	Fragments of Ci go by but they have very few particles. Much blue sky everywhere.
18:12:15	6.3	-30.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:12:30	6.3	-30.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:12:45	6.3	-30.7	0.00000	0.00000	0	0.00	0.	0	0.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
18:13:00	6.3	-31.1	0.00000	0.00000	0	0.00	0.	0	0.00
18:13:15	6.3	-31.0	0.00000	0.00000	0	0.00	0.	0	0.00
18:13:30	6.3	-30.8	0.00000	0.00000	0	0.00	0.	0	0.00
18:13:45	6.3	-30.2	0.00000	0.00000	0	0.00	0.	0	0.00
18:14:00	6.2	-30.1	0.00000	0.00000	0	0.00	0.	0	0.00
18:14:15	6.2	-30.2	0.00000	0.00000	0	0.00	0.	0	0.00
18:14:30	6.2	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00
18:14:45	6.2	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00
18:15:00	6.2	-29.8	0.00000	0.00000	0	0.00	0.	0	0.00
18:15:15	6.2	-29.8	0.00000	0.00000	0	0.00	0.	0	0.00
18:15:30	6.2	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00
18:15:45	6.2	-29.4	0.00000	0.00000	0	0.00	0.	0	0.00
18:16:00	6.2	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00
18:16:15	6.2	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00
18:16:30	6.2	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00
18:16:45	6.2	-29.8	0.00000	0.00000	0	0.00	0.	0	0.00
18:17:00	6.3	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00
18:17:15	6.3	-29.9	.00000	0.00000	0	0.00	0.	4	0.00
18:17:30	6.3	-29.9	.00000	0.00000	0	0.00	0.	6	0.00
18:17:45	6.3	-30.0	.00000	0.00000	0	0.00	0.	4	0.00
18:18:00	6.3	-30.0	.00000	0.00000	0	0.00	0.	6	0.00
18:18:15	6.3	-30.1	.00000	0.00000	0	0.00	0.	4	0.00
18:18:30	6.3	-30.1	.00000	0.00000	0	0.00	0.	2	0.00
18:18:45	6.3	-30.2	.00000	.00001	100	50.53	96.	87	1.00
18:19:00	6.3	-30.2	.00000	0.00000	0	0.00	0.	4	0.00
18:19:15	6.3	-30.2	.00000	0.00000	0	0.00	0.	6	0.00
18:19:30	6.3	-30.3	.00000	0.00000	0	0.00	0.	6	0.00
18:19:45	6.3	-30.3	.00000	0.00000	0	0.00	0.	6	0.00
18:20:00	6.3	-30.4	.00000	0.00000	0	0.00	0.	6	0.00
18:20:15	6.3	-30.4	.00000	0.00000	0	0.00	0.	6	0.00
18:20:30	6.3	-30.4	.00001	0.00000	0	0.00	0.	6	0.00
18:20:45	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00
18:21:00	6.3	-30.5	.00000	0.00000	0	0.00	0.	8	0.00
18:21:15	6.3	-30.4	.00000	0.00000	0	0.00	0.	6	0.00
18:21:30	6.3	-30.4	.00000	0.00000	0	0.00	0.	6	0.00
18:21:45	6.3	-30.5	.00001	0.00000	0	0.00	0.	8	0.00
18:22:00	6.3	-30.5	.00000	0.00000	0	0.00	0.	6	0.00
18:22:15	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00
18:22:30	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00
18:22:45	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00
18:23:00	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00
18:23:15	6.3	-30.5	.00001	0.00000	0	0.00	0.	8	0.00
18:23:30	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:23:45	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00	
18:24:00	6.3	-30.5	.00001	0.00000	0	0.00	0.	6	0.00	
18:24:15	6.3	-30.5	.00001	0.00000	0	0.00	0.	8	0.00	
18:24:30	6.3	-30.5	.00001	0.00000	0	0.00	0.	8	0.00	
18:24:45	6.3	-30.3	.00001	0.00000	0	0.00	0.	6	0.00	
18:25:00	6.3	-30.3	.00001	0.00000	0	0.00	0.	6	0.00	
18:25:15	6.3	-30.3	.00001	0.00000	0	0.00	0.	8	0.00	
18:25:30	6.3	-30.3	.00001	0.00000	0	0.00	0.	6	0.00	
18:25:45	6.3	-30.3	.00002	0.00000	0	0.00	0.	8	0.00	
18:26:00	6.3	-30.4	.00002	0.00000	0	0.00	0.	8	0.00	
18:26:15	6.3	-30.4	.00003	0.00000	0	0.00	0.	8	0.00	
18:26:30	6.3	-30.3	.00002	0.00000	0	0.00	0.	6	0.00	
18:26:45	6.3	-30.3	.00002	0.00000	0	0.00	0.	6	0.00	A little haz - getting a little data in axial probe. Ahead vis = ~ 10 mi.
18:27:00	6.3	-30.2	.00002	0.00000	0	0.00	0.	8	0.00	
18:27:15	6.3	-30.2	.00002	0.00000	0	0.00	0.	8	0.00	
18:27:30	6.3	-30.2	.00002	0.00000	0	0.00	0.	6	0.00	
18:27:45	6.3	-30.3	.00002	0.00000	0	0.00	0.	8	0.00	No clouds here, but it is a little hazy.
18:28:00	6.3	-30.3	.00002	0.00000	0	0.00	0.	8	0.00	Very thin. Thin haze obscures vis in all directions, especially ahead.
18:28:15	6.3	-30.3	.00002	0.00000	0	0.00	0.	8	0.00	
18:28:30	6.3	-30.3	.00002	0.00000	0	0.00	0.	8	0.00	
18:28:45	6.3	-30.3	.00003	0.00000	0	0.00	0.	6	0.00	
18:29:00	6.3	-30.2	.00004	0.00000	0	0.00	0.	8	0.00	
18:29:15	6.3	-30.2	.00003	0.00000	0	0.00	0.	8	0.00	
18:29:30	6.3	-30.2	.00003	0.00000	0	0.00	0.	8	0.00	
18:29:45	6.3	-30.2	.00004	0.00000	0	0.00	0.	8	0.00	
18:30:00	6.3	-30.2	.00002	0.00000	0	0.00	0.	8	0.00	
18:30:15	6.3	-30.2	.00004	0.00000	0	0.00	0.	8	0.00	
18:30:30	6.3	-30.2	.00005	0.00000	0	0.00	0.	8	0.00	
18:30:45	6.3	-30.2	.00005	0.00000	0	0.00	0.	8	0.00	Bright blue sky.
18:31:00	6.3	-30.1	.00005	0.00000	0	0.00	0.	8	0.00	
18:31:15	6.3	-30.1	.00006	0.00000	0	0.00	0.	8	0.00	
18:31:30	6.3	-30.3	.00007	0.00000	0	0.00	0.	8	0.00	
18:31:45	6.3	-30.2	.00006	0.00000	0	0.00	0.	8	0.00	
18:32:00	6.3	-30.2	.00007	0.00000	0	0.00	0.	8	0.00	
18:32:15	6.3	-30.2	.00007	0.00000	0	0.00	0.	8	0.00	
18:32:30	6.3	-30.3	.00007	0.00000	0	0.00	0.	8	0.00	
18:32:45	6.3	-30.4	.00007	0.00000	0	0.00	0.	8	0.00	
18:33:00	6.3	-30.3	.00008	0.00000	0	0.00	0.	8	0.00	In a very thin haze, but no real cloud.
18:33:15	6.3	-30.3	.00006	0.00000	0	0.00	0.	8	0.00	
18:33:30	6.3	-30.2	.00005	0.00000	0	0.00	0.	8	0.00	
18:33:45	6.3	-29.9	.00004	0.00000	0	0.00	0.	8	0.00	
18:34:00	6.3	-29.4	.00003	0.00000	0	0.00	0.	6	0.00	
18:34:15	6.3	-29.5	.00002	0.00000	0	0.00	0.	8	0.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DO UM	NT N/M**3	LMAX UM	FF	
18:34:30	6.3	-29.5	.00001	0.00000	0	0.00	0.	8	0.00	
18:34:45	6.3	-29.7	.00001	0.00000	0	0.00	0.	8	0.00	
18:35:00	6.3	-29.7	.00001	0.00000	0	0.00	0.	6	0.00	
18:35:15	6.3	-29.7	.00000	0.00000	0	0.00	0.	6	0.00	
18:35:30	6.3	-29.7	.00000	0.00000	0	0.00	0.	6	0.00	
18:35:45	6.4	-29.9	.00000	0.00000	0	0.00	0.	6	0.00	
18:36:00	6.4	-29.9	.00000	0.00000	0	0.00	0.	4	0.00	
18:36:15	6.4	-29.8	.00000	0.00000	0	0.00	0.	6	0.00	
18:36:30	6.4	-29.9	.00000	0.00000	0	0.00	0.	6	0.00	
18:36:45	6.3	-29.9	.00000	0.00000	0	0.00	0.	6	0.00	
18:37:00	6.3	-29.7	.00000	0.00000	0	0.00	0.	4	0.00	
18:37:15	6.3	-29.6	.00000	0.00000	0	0.00	0.	6	0.00	
18:37:30	6.5	-30.8	.00000	0.00000	0	0.00	0.	4	0.00	
18:37:45	6.7	-32.0	.00000	0.00000	0	0.00	0.	10	0.00	
18:38:00	6.7	-32.6	.00000	0.00000	0	0.00	0.	4	0.00	
18:38:15	6.7	-32.5	.00000	0.00000	0	0.00	0.	14	0.00	
18:38:30	6.7	-32.0	.00001	.00003	100	90.05	109.	209	.89	
18:38:45	6.6	-30.2	.00008	.00008	100	71.11	1061.	209	.64	
18:39:00	6.6	-30.1	.00153	.00188	42	159.80	12085.	1202	.27	
18:39:15	6.6	-31.0	.00241	.00069	15	225.48	6598.	923	.29	Heading toward more cloud. In it now.
18:39:30	6.6	-30.9	.00069	.00136	72	122.00	3645.	644	.58	
18:39:45	6.6	-31.2	.00008	.00022	99	111.35	715.	413	.65	Out of it about now.
18:40:00	6.4	-30.0	.00011	.00029	100	123.80	831.	311	.65	
18:40:15	6.4	-29.4	.00042	.00035	100	87.11	1836.	311	.63	
18:40:30	6.4	-29.6	.00076	.00048	99	73.95	3711.	413	.65	
18:40:45	6.4	-29.8	.00042	.00042	99	133.70	440.	413	.89	
18:41:00	6.3	-29.8	.00000	0.00000	0	181.22	0.	413	1.00	
18:41:15	6.2	-28.2	.00002	.00004	76	100.38	668.	413	.29	
18:41:30	6.2	-27.5	.00024	.00053	76	121.07	1712.	644	.54	
18:41:45	6.2	-27.7	.00075	.00069	54	136.01	4522.	644	.34	
18:42:00	6.2	-28.0	.00029	.00038	86	110.44	3501.	413	.37	Can see occasional filaments go by above. Heavier now.
18:42:15	6.2	-28.5	.00008	.00021	62	132.96	1620.	644	.35	
18:42:30	6.3	-28.7	.00008	.00025	97	133.31	481.	413	.68	
18:42:45	6.3	-28.8	.00008	.00046	93	121.18	1197.	413	.64	
18:43:00	6.4	-29.3	.00012	.00005	53	86.00	748.	413	.29	
18:43:15	6.4	-29.4	.00039	.00010	92	66.57	1617.	413	.35	Seem to be near base of a Ci layer ~ 1000 feet thick.
18:43:30	6.4	-29.7	.00001	0.00000	0	0.00	0.	6	0.00	
18:43:45	6.4	-29.6	.00002	0.00000	0	0.00	0.	24	0.00	
18:44:00	6.4	-28.4	.00000	0.00000	0	0.00	0.	4	0.00	Out of most of it now, but still getting counts.
18:44:15	6.3	-27.8	0.00000	.00004	100	109.80	56.	250	1.00	
18:44:30	6.3	-27.3	.00000	0.00000	0	0.00	0.	4	0.00	
18:44:45	6.3	-27.2	.00003	.00004	100	99.56	171.	230	.69	
18:45:00	6.3	-28.1	.00000	.00001	100	58.07	93.	108	1.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:45:15	6.3	-28.3	.00003	.00002	100	91.96	47.	209	1.00	
18:45:30	6.3	-28.8	.00003	.00004	100	109.80	57.	250	1.00	
18:45:45	6.3	-28.9	.00000	.00002	100	33.34	862.	47	1.00	
18:46:00	6.4	-29.3	.00002	.00012	95	134.36	101.	413	.92	
18:46:15	6.4	-29.4	.00134	.00058	29	184.60	6169.	923	.24	
18:46:30	6.3	-28.8	.00576	.00232	10	266.98	24932.	2039	.21	
18:46:45	6.2	-28.3	.00433	.00179	15	243.03	14201.	1760	.24	
18:47:00	6.2	-28.4	.00191	.00143	27	188.21	7439.	1202	.35	
18:47:15	6.2	-28.1	0.00000	.00001	18	297.51	212.	923	.11	
18:47:30	6.2	-27.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:47:45	6.2	-28.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:48:00	6.2	-27.9	.00010	.00007	93	106.93	658.	413	.42	Good visibility. Bright sun, no clouds below.
18:48:15	6.1	-27.5	.00003	.00007	96	92.01	335.	413	.71	
18:48:30	6.2	-27.8	.00002	0.00000	0	0.00	0.	28	0.00	
18:48:45	6.2	-28.1	.00003	0.00000	0	275.70	1.	644	.92	
18:49:00	6.3	-28.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:49:15	6.3	-28.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:49:30	6.4	-29.4	0.00000	0.00000	0	0.00	0.	0	0.00	Still very bright. The cloud we went thru didn't seem very thick at all,
18:49:45	6.4	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00	but we did get precip data.
18:50:00	6.5	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:50:15	6.5	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:50:30	6.5	-30.1	0.00000	.00003	100	100.88	49.	230	1.00	
18:50:45	6.5	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
18:51:00	6.5	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:51:15	6.5	-30.1	0.00000	0.00000	0	0.00	0.	0	0.00	
18:51:30	6.5	-29.9	.00001	0.00000	0	0.00	0.	26	0.00	
18:51:45	6.5	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:52:00	6.5	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00	
18:52:15	6.5	-29.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:52:30	6.5	-29.8	0.00000	0.00000	0	0.00	0.	0	0.00	
18:52:45	6.5	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:53:00	6.5	-29.9	.00000	0.00000	0	0.00	0.	6	0.00	Heading for a long piece of Ci. Will turn right and go along it.
18:53:15	6.5	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00	
18:53:30	6.5	-29.8	0.00000	.00001	100	42.18	195.	67	1.00	
18:53:45	6.5	-29.8	.00000	.00004	100	109.80	55.	250	1.00	
18:54:00	6.5	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
18:54:15	6.5	-29.6	.00001	.00007	100	77.56	427.	209	.84	
18:54:30	6.5	-29.3	.00009	.00011	100	79.31	401.	230	.91	
18:54:45	6.5	-29.3	.00019	.00028	100	75.32	1953.	311	.50	
18:55:00	6.5	-29.4	.00003	.00008	100	42.93	1103.	100	1.25	
18:55:15	6.5	-29.4	.00001	.00002	100	38.00	538.	87	.83	
18:55:30	6.5	-29.4	.00004	.00002	100	38.00	539.	87	.83	
18:55:45	6.5	-29.3	.00000	.00001	100	45.15	59.	128	.86	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
18:56:00	6.5	-29.2	.00001	0.00000	0	0.00	0.	24	0.00	
18:56:15	6.4	-29.1	.00000	0.00000	0	0.00	0.	12	0.00	
18:56:30	6.4	-29.0	.00000	.00001	100	42.38	201.	67	1.00	
18:56:45	6.4	-29.1	.00000	0.00000	0	0.00	0.	4	0.00	
18:57:00	6.4	-29.0	0.00000	0.00000	0	0.00	0.	0	0.00	
18:57:15	6.4	-28.8	.00000	.00013	100	116.65	213.	311	.87	
18:57:30	6.4	-28.7	.00000	.00002	100	91.96	44.	209	1.00	
18:57:45	6.4	-29.1	.00000	0.00000	0	0.00	0.	10	0.00	
18:58:00	6.4	-29.1	.00000	0.00000	0	0.00	0.	6	0.00	
18:58:15	6.4	-29.2	.00003	.00003	100	90.13	127.	209	.82	The long Ci cloud is off our left wing tip now. Probably now in clear air.
18:58:30	6.4	-29.3	0.00000	.00001	87	58.60	81.	413	.49	
18:58:45	6.4	-29.2	.00000	.00013	100	133.54	215.	311	.72	
18:59:00	6.4	-28.8	.00005	.00013	92	121.31	258.	413	.72	
18:59:15	6.4	-28.9	.00005	.00022	92	133.32	321.	413	.76	
18:59:30	6.4	-28.5	.00005	.00003	78	91.80	240.	413	.39	
18:59:45	6.4	-28.5	.00005	.00030	99	111.11	607.	413	.82	
19:00:00	6.3	-28.6	.00009	.00008	100	98.65	388.	230	.71	
19:00:15	6.3	-28.3	.00031	.00100	98	119.52	1875.	413	.80	
19:00:30	6.4	-28.4	.00090	.00287	99	100.34	7115.	413	.76	
19:00:45	6.4	-28.6	.00125	.00382	99	100.15	12139.	413	.73	
19:01:00	6.4	-28.5	.00058	.00151	100	86.24	8073.	311	.66	
19:01:15	6.4	-28.7	.00004	.00003	100	62.26	960.	148	.61	
19:01:30	6.4	-28.7	.00006	.00001	100	65.15	60.	128	1.00	Main cloud is off our left wing probably a mile away. We seem to be in
19:01:45	6.4	-28.7	.00001	0.00000	0	0.00	0.	22	0.00	clear air. Main cloud is outside of out area.
19:02:00	6.4	-28.7	.00000	.00001	100	65.15	59.	128	1.00	
19:02:15	6.4	-28.7	.00005	.00022	100	121.11	553.	311	.67	
19:02:30	6.4	-28.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:02:45	6.4	-28.5	0.00000	0.00000	0	0.00	0.	0	0.00	
19:03:00	6.4	-28.7	.00000	.00001	100	71.87	47.	148	1.00	
19:03:15	6.4	-28.7	.00000	.00003	100	76.96	196.	169	.84	
19:03:30	6.3	-28.4	.00002	.00003	100	55.25	349.	169	.86	
19:03:45	6.4	-28.5	.00002	.00019	99	122.42	341.	413	.78	
19:04:00	6.4	-28.2	0.00000	0.00000	0	0.00	0.	0	0.00	
19:04:15	6.4	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:04:30	6.4	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:04:45	6.4	-28.7	0.00000	0.00000	0	0.00	0.	0	0.00	No clouds above. Headed Ci 30 miles away.
19:05:00	6.4	-28.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:05:15	6.4	-28.7	0.00000	0.00000	0	0.00	0.	0	0.00	
19:05:30	6.5	-28.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:05:45	6.5	-28.7	0.00000	0.00000	0	0.00	0.	0	0.00	
19:06:00	6.5	-28.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:06:15	6.6	-28.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:06:30	6.6	-29.0	.00000	0.00000	0	0.00	0.	4	0.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:06:45	6.6	-29.1	.00000	0.00000	0	0.00	0.	4	0.00	
19:07:00	6.6	-29.1	.00000	0.00000	0	0.00	0.	4	0.00	Looks like solid cloud ahead 20 mi.
19:07:15	6.6	-29.2	.00000	0.00000	0	0.00	0.	4	0.00	
19:07:30	6.6	-29.3	.00000	0.00000	0	0.00	0.	4	0.00	
19:07:45	6.6	-29.2	.00000	0.00000	0	0.00	0.	6	0.00	
19:08:00	6.6	-29.2	.00000	0.00000	0	0.00	0.	6	0.00	
19:08:15	6.6	-29.2	.00000	0.00000	0	0.00	0.	4	0.00	
19:08:30	6.6	-29.2	.00000	0.00000	0	0.00	0.	4	0.00	
19:08:45	6.6	-29.3	.00000	0.00000	0	0.00	0.	4	0.00	
19:09:00	6.7	-29.5	.00000	0.00000	0	0.00	0.	6	0.00	
19:09:15	6.7	-29.5	.00000	0.00000	0	0.00	0.	6	0.00	
19:09:30	6.7	-29.4	.00000	0.00000	0	0.00	0.	6	0.00	
19:09:45	6.7	-29.5	.00000	0.00000	0	0.00	0.	4	0.00	
19:10:00	6.7	-29.5	.00000	0.00000	0	0.00	0.	4	0.00	
19:10:15	6.7	-29.5	.00000	0.00000	0	0.00	0.	6	0.00	
19:10:30	6.8	-29.8	.00000	0.00000	0	0.00	0.	4	0.00	
19:10:45	6.8	-29.8	.00000	0.00000	0	0.00	0.	6	0.00	
19:11:00	6.8	-30.0	.00013	.00015	100	48.05	2551.	169	.86	
19:11:15	6.9	-30.6	.00076	.00150	100	60.21	22553.	311	.62	
19:11:30	7.1	-31.7	.00047	.00066	100	56.82	9855.	311	.55	
19:11:45	7.1	-31.7	.00052	.00090	100	59.60	11476.	311	.49	
19:12:00	7.1	-32.0	.00076	.00127	99	63.26	16011.	413	.59	
19:12:15	7.1	-31.8	.00065	.00131	99	76.00	14083.	413	.54	
19:12:30	7.0	-31.3	.00026	.00040	100	77.47	3311.	311	.45	
19:12:45	7.0	-31.4	.00052	.00080	100	54.58	12563.	311	.52	
19:13:00	7.0	-31.5	.00035	.00057	100	57.57	8399.	189	.78	
19:13:15	7.0	-31.5	.00045	.00062	100	67.60	7185.	311	.55	
19:13:30	7.0	-31.5	.00028	.00043	99	78.60	4864.	413	.49	
19:13:45	7.0	-31.4	.00038	.00081	100	72.26	8116.	311	.50	
19:14:00	7.0	-31.2	.00039	.00060	99	69.94	6197.	413	.63	
19:14:15	7.0	-31.0	.00012	.00030	100	61.30	3522.	209	.72	
19:14:30	7.0	-31.2	.00061	.00131	100	75.17	12484.	250	.61	
19:14:45	7.0	-31.1	.00148	.00351	100	83.21	23169.	311	.56	
19:15:00	7.0	-30.9	.00074	.00109	100	68.98	20736.	311	.61	
19:15:15	7.0	-30.9	.00075	.00178	100	68.34	19350.	250	.64	In thin Ci.
19:15:30	7.0	-31.2	.00057	.00145	99	80.45	10584.	413	.55	
19:15:45	7.0	-31.1	.00051	.00129	100	72.79	11896.	311	.56	
19:16:00	7.1	-31.2	.00037	.00100	100	57.53	14960.	250	.64	
19:16:15	7.1	-31.3	.00026	.00057	100	74.51	5200.	311	.48	
19:16:30	7.1	-31.1	.00030	.00082	100	70.50	7857.	311	.58	
19:16:45	7.0	-31.1	.00002	.00017	100	114.66	984.	311	.48	
19:17:00	7.0	-30.7	0.00000	0.00000	0	0.00	0.	0	0.00	
19:17:15	7.0	-30.5	.00006	.00029	100	61.75	1456.	250	.53	

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START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:17:30	7.0	-30.4	.00017	.00006	100	32.51	1547.	87	1.26	
19:17:45	7.0	-30.3	.00039	.00124	100	81.16	8379.	311	.54	Much blue sky above us.
19:18:00	7.0	-30.7	.00018	.00016	100	53.54	2742.	169	.74	Flying right along the edge of the clouds.
19:18:15	6.9	-30.7	0.00000	0.00000	0	0.00	0.	0	0.00	
19:18:30	6.9	-30.3	0.00000	0.00000	0	0.00	0.	0	0.00	
19:18:45	6.8	-30.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:19:00	6.8	-29.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:19:15	6.8	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:19:30	6.8	-29.4	0.00000	0.00000	0	0.00	0.	0	0.00	
19:19:45	6.8	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00	
19:20:00	6.8	-29.9	0.00000	.00001	100	71.87	48.	148	1.00	
19:20:15	6.9	-30.1	.00002	.00008	100	54.05	1009.	189	.60	
19:20:30	6.9	-30.2	.00047	.00064	100	60.37	7457.	209	.77	
19:20:45	7.0	-30.6	.00039	.00107	100	54.29	17798.	311	.51	
19:21:00	7.0	-30.5	.00046	.00069	100	55.22	12280.	250	.64	
19:21:15	7.0	-30.6	.00079	.00222	100	73.31	20933.	311	.59	Right now the cloud is pretty thick. Vis left is very good, but can't
19:21:30	7.0	-30.6	.00061	.00115	100	67.12	10830.	311	.63	see much to the right at all.
19:21:45	7.0	-30.5	.00059	.00159	100	79.60	9230.	311	.67	
19:22:00	7.0	-30.4	.00063	.00242	99	97.06	10725.	413	.61	
19:22:15	7.0	-30.2	.00085	.00231	99	110.25	7509.	413	.65	
19:22:30	7.0	-30.1	.00014	.00043	97	102.02	1148.	413	.70	
19:22:45	7.0	-30.2	.00026	.00096	99	99.41	3162.	413	.70	Still relatively heavy. Blue sky upward.
19:23:00	7.0	-30.2	.00028	.00059	100	83.90	3228.	250	.71	
19:23:15	7.0	-30.3	.00018	.00051	100	94.68	2723.	250	.68	Back into lighter cloud. Will move left to get into thinner stuff.
19:23:30	7.0	-30.4	.00009	.00026	99	110.27	1452.	413	.51	
19:23:45	7.0	-30.5	.00014	.00046	98	115.23	1810.	413	.74	
19:24:00	7.0	-30.3	.00044	.00141	99	112.21	3898.	413	.70	
19:24:15	7.0	-30.2	.00069	.00211	98	104.97	10232.	413	.56	
19:24:30	7.0	-30.1	.00010	.00032	100	81.64	2417.	250	.67	
19:24:45	7.0	-30.2	.00015	.00035	99	88.39	3201.	413	.56	
19:25:00	7.0	-30.0	.00008	.00016	100	50.72	2686.	169	.83	
19:25:15	7.0	-30.2	.00057	.00209	98	3.27	9311.	413	.59	
19:25:30	7.0	-30.1	.00121	.00332	99	94.65	15650.	413	.60	
19:25:45	7.0	-30.1	.00037	.00126	99	124.96	3885.	413	.61	
19:26:00	7.0	-30.1	.00018	.00048	100	58.70	5982.	311	.53	Can begin to see down to ground. Very thin filaments are going by.
19:26:15	7.0	-30.0	.00022	.00057	100	74.76	5064.	311	.57	Flying parallel to big Ci band.
19:26:30	7.0	-30.0	.00016	.00026	100	59.73	3256.	230	.68	
19:26:45	7.0	-29.9	.00008	.00018	100	65.22	2336.	250	.56	
19:27:00	7.0	-29.9	.00011	.00033	100	85.23	1588.	311	.61	The sun shines brightly on low stratus now.
19:27:15	7.0	-29.9	.00001	0.00000	0	0.00	0.	24	0.00	
19:27:30	7.0	-29.9	0.00000	0.00000	0	0.00	0.	4	0.00	
19:27:45	7.0	-29.9	.00006	.00002	100	18.00	529.	87	.93	
19:28:00	7.0	-30.0	.00031	.00045	100	56.65	7218.	230	.67	

05 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:28:15	7.0	-29.9	.00050	.00085	100	53.83	13190.	250	.66	Moving into thicker Ci.
19:28:30	7.0	-29.5	.00146	.00371	99	77.93	34300.	413	.51	
19:28:45	7.0	-29.7	.00168	.00375	100	69.94	36071.	311	.55	
19:29:00	7.0	-29.8	.00158	.00325	99	70.75	33360.	413	.57	
19:29:15	7.0	-30.0	.00134	.00324	99	78.78	23650.	413	.56	
19:29:30	7.0	-30.2	.00138	.00328	99	83.33	19851.	413	.59	
19:29:45	7.0	-30.2	.00047	.00086	100	70.64	8373.	311	.60	
19:30:00	7.0	-30.3	.00015	.00051	100	74.06	4937.	311	.46	Blue sky with filaments going by.
19:30:15	7.0	-30.3	.00006	.00014	100	76.19	1501.	289	.66	
19:30:30	7.0	-30.3	.00016	.00029	100	83.48	2731.	311	.47	
19:30:45	7.0	-30.2	.00027	.00038	100	67.05	4198.	311	.58	
19:31:00	7.0	-30.1	.00048	.00108	100	81.47	7698.	311	.58	
19:31:15	7.0	-30.1	.00078	.00135	100	67.85	16081.	311	.54	
19:31:30	7.0	-30.1	.00091	.00119	100	60.55	15877.	311	.59	Vis ahead ~ 10 mi.
19:31:45	7.0	-30.2	.00066	.00099	100	57.35	15537.	250	.63	Very, very thin Ci.
19:32:00	7.0	-30.3	.00049	.00117	100	59.18	15564.	311	.59	
19:32:15	7.0	-30.3	.00068	.00104	100	53.22	17163.	250	.71	
19:32:30	7.0	-30.2	.00089	.00121	100	54.53	19204.	311	.53	
19:32:45	7.0	-30.3	.00075	.00099	100	56.47	15485.	250	.68	A little heavier now. Still thin; vis ahead 7-10 mi.
19:33:00	7.0	-30.7	.00069	.00119	100	54.77	17146.	311	.61	
19:33:15	7.1	-30.9	.00091	.00153	100	53.59	25491.	311	.62	Very thin. Very bright blue above.
19:33:30	7.1	-31.1	.00259	.00545	100	61.85	64340.	311	.58	
19:33:45	7.1	-31.2	.00290	.00693	100	59.24	95204.	311	.61	
19:34:00	7.1	-31.0	.00251	.00639	100	67.23	67092.	311	.62	
19:34:15	7.1	-31.0	.00195	.00439	100	69.34	[illegible]	311	.59	Just about in middle of Ci layer at 23,200 feet. 62 miles from Tulsa.
19:34:30	7.1	-30.8	.00149	.00371	100	69.71	[illegible]	250	.70	
19:34:45	7.1	-30.8	.00175	.00520	100	77.47	[illegible]	311	.62	Vis ~ 5 mi.
19:35:00	7.1	-30.8	.00148	.00520	100	84.96	7362.	311	.68	
19:35:15	7.1	-31.0	.00108	.00372	99	93.67	15391.	413	.68	
19:35:30	7.1	-30.8	.00054	.00173	100	92.62	6826.	311	.70	
19:35:45	7.1	-30.8	.00093	.00455	99	111.74	11097.	413	.74	
19:36:00	7.1	-30.9	.00187	.00539	99	107.02	16732.	413	.68	
19:36:15	7.1	-30.9	.00166	.00562	100	97.46	20904.	311	.70	
19:36:30	7.1	-30.7	.00090	.00262	100	79.87	15620.	311	.69	
19:36:45	7.1	-30.3	.00037	.00136	100	89.61	5935.	311	.72	
19:37:00	7.1	-30.6	.00044	.00118	100	83.29	7948.	311	.62	
19:37:15	7.1	-30.8	.00055	.00138	100	63.55	14487.	230	.77	
19:37:30	7.1	-31.0	.00060	.00125	100	58.45	16926.	289	.79	
19:37:45	7.1	-31.0	.00075	.00214	100	78.91	16609.	250	.71	
19:38:00	7.1	-31.1	.00052	.00260	100	86.46	12398.	311	.67	
19:38:15	7.1	-31.0	.00044	.00122	100	91.88	4822.	311	.78	
19:38:30	7.1	-30.9	.00017	.00018	100	80.29	845.	250	.79	
19:38:45	7.1	-30.9	.00008	.00022	100	84.94	1450.	311	.50	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	MT M/M**3	LMAX UM	FF	
19:39:00	7.1	-30.9	.00009	.00025	100	75.05	1704.	230	.73	
19:39:15	7.1	-30.9	.00008	.00029	100	93.43	1328.	250	.70	
19:39:30	7.1	-30.9	.00030	.00112	100	88.43	5980.	311	.64	
19:39:45	7.1	-30.7	.00010	.00024	100	97.21	801.	250	.82	
19:40:00	7.1	-30.8	.00011	.00038	99	107.35	1171.	413	.75	
19:40:14	7.1	-30.8	.00049	.00127	100	91.46	4995.	311	.70	
19:40:29	7.1	-30.8	.00056	.00170	100	80.94	9228.	311	.64	Ci band on the right is 5 mi away, but it does not have a shadow.
19:40:44	7.1	-30.7	.00115	.00330	100	81.41	19874.	311	.65	Ci probably wouldn't look so thick from the ground.
19:40:59	7.1	-30.8	.00121	.00369	100	79.37	24881.	311	.61	
19:41:14	7.1	-30.9	.00086	.00202	100	61.63	23480.	250	.71	
19:41:29	7.1	-30.9	.00051	.00117	100	54.77	17269.	209	.77	
19:41:44	7.1	-30.9	.00049	.00072	100	49.22	12632.	230	.75	
19:41:59	7.1	-30.9	.00043	.00071	100	54.93	12531.	189	.74	
19:42:14	7.1	-31.0	.00031	.00054	100	68.23	5486.	250	.63	
19:42:29	7.1	-31.0	.00020	.00055	100	86.60	3609.	311	.58	
19:42:44	7.1	-31.0	.00020	.00076	100	101.73	1896.	311	.84	
19:42:59	7.1	-31.1	.00041	.00178	99	111.42	5254.	413	.67	Into heavier Ci. Vis now 3-4 mi, but still can see through to ground.
19:43:14	7.1	-31.1	.00148	.00549	99	115.26	13925.	413	.70	
19:43:29	7.1	-31.1	.00151	.00602	99	111.87	15457.	413	.72	
19:43:44	7.1	-31.1	.00212	.00641	99	118.83	15663.	413	.69	
19:43:59	7.1	-31.1	.00178	.00556	86	118.73	15092.	644	.62	Very heavy, but blue skies are visible thru thin Ci.
19:44:14	7.1	-31.0	.00199	.00651	98	125.85	15623.	413	.67	
19:44:29	7.1	-31.1	.00139	.00442	99	118.87	10719.	413	.70	
19:44:44	7.1	-31.2	.00132	.00370	95	120.91	13206.	413	.56	
19:44:59	7.1	-31.1	.00149	.00214	78	127.12	9736.	644	.46	
19:45:14	7.1	-31.0	.00124	.00384	96	120.96	10724.	413	.63	Can see tops of Ci to our right; blue sky above the Ci.
19:45:29	7.1	-31.2	.00055	.00256	99	118.89	5563.	413	.73	
19:45:44	7.1	-31.2	.00027	.00124	100	116.19	2982.	311	.71	
19:45:59	7.1	-31.4	.00141	.00517	99	98.15	19278.	413	.69	
19:46:14	7.2	-31.6	.00183	.00589	100	95.50	21707.	311	.70	
19:46:29	7.2	-31.8	.00136	.00385	100	86.32	19491.	311	.67	
19:46:44	7.2	-32.1	.00153	.00570	99	88.51	28607.	413	.65	
19:46:59	7.3	-32.2	.00045	.00123	100	75.69	11441.	311	.58	
19:47:14	7.3	-32.3	.00025	.00041	100	75.75	2863.	311	.57	Much white in all directions, but up - there its blue sky.
19:47:29	7.3	-32.4	.00017	.00039	100	80.15	3131.	311	.53	
19:47:44	7.3	-32.4	.00039	.00096	99	78.67	9268.	413	.52	
19:47:59	7.4	-32.6	.00037	.00046	100	58.31	6579.	311	.47	
19:48:14	7.4	-32.7	.00050	.00046	100	50.64	8659.	230	.62	At the tops of the Cs. Farmland is still relatively bright.
19:48:29	7.4	-32.8	.00033	.00039	100	58.96	5571.	230	.63	
19:48:44	7.4	-33.1	.00011	.00018	100	66.84	1641.	189	.84	
19:48:59	7.4	-33.0	.00069	.00232	100	82.53	15419.	311	.57	
19:49:14	7.4	-32.9	.00074	.00213	100	75.41	17021.	311	.63	
19:49:29	7.4	-33.0	.00027	.00092	100	100.74	3621.	311	.64	

AD-A118 715 AIR FORCE GEOPHYSICS LAB HANSCOM AFB MA F/G 4/2
CIRRUS PARTICLE DISTRIBUTION STUDY. PART 8.(U)
OCT 81 I D COHEN
UNCLASSIFIED AFGL-TR-81-0316 NL

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
19:49:44	7.4	-33.0	.00016	.00056	100	83.14	3118.	311	.67	
19:49:59	7.4	-33.0	.00092	.00218	100	59.86	29714.	311	.63	
19:50:14	7.4	-33.0	.00092	.00139	99	57.12	21033.	413	.70	
19:50:29	7.4	-32.9	.00052	.00147	100	70.72	13432.	311	.55	
19:50:44	7.4	-32.9	.00066	.00126	100	61.26	15431.	230	.72	
19:50:59	7.4	-32.8	.00012	.00018	99	55.91	2677.	413	.52	
19:51:14	7.4	-32.9	.00012	.00016	100	52.97	3191.	169	.71	Now breaking out into thin Ci. Almost in clear air now. The Ci band is
19:51:29	7.4	-32.8	.00004	.00004	100	44.66	920.	108	.82	5 mi off our rt wing tip.
19:51:44	7.4	-32.7	.00001	0.00000	0	0.00	0.	24	0.00	
19:51:59	7.4	-32.9	.00000	0.00000	0	0.00	0.	18	0.00	
19:52:14	7.4	-32.8	.00001	0.00000	0	0.00	0.	20	0.00	
19:52:29	7.4	-33.1	.00000	.00002	100	50.74	517.	169	.61	
19:52:44	7.4	-33.0	.00000	0.00000	0	0.00	0.	10	0.00	
19:52:59	7.4	-33.0	.00000	0.00000	0	0.00	0.	10	0.00	Very clear air.
19:53:14	7.4	-32.8	0.00000	0.00000	0	0.00	0.	0	0.00	
19:53:29	7.4	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:53:44	7.4	-33.1	0.00000	0.00000	0	0.00	0.	0	0.00	
19:53:59	7.4	-33.1	.00000	0.00000	0	0.00	0.	14	0.00	
19:54:14	7.4	-33.1	0.00000	0.00000	0	0.00	0.	0	0.00	
19:54:29	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:54:44	7.4	-32.7	.00000	.00001	100	33.34	385.	47	1.00	
19:54:59	7.5	-33.1	0.00000	0.00000	0	0.00	0.	0	0.00	
19:55:14	7.4	-33.1	0.00000	0.00000	0	0.00	0.	0	0.00	
19:55:29	7.4	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	In clr air, Ci band is off to rt, 5-10 mi.
19:55:44	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:55:59	7.4	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:56:14	7.4	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00	
19:56:29	7.4	-32.9	0.00000	.00001	100	58.87	74.	108	1.00	
19:56:44	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:56:59	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:57:14	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:57:29	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:57:44	7.4	-32.9	0.00000	.00001	100	65.15	55.	128	1.00	
19:57:59	7.4	-32.9	.00000	0.00000	0	0.00	0.	0	0.00	Moving over to right to get closer to Ci.
19:58:14	7.4	-32.9	.00000	0.00000	0	0.00	0.	6	0.00	
19:58:29	7.4	-32.9	.00004	.00014	100	72.10	1332.	230	.61	
19:58:44	7.4	-32.9	.00003	.00007	100	69.63	668.	169	.77	
19:58:59	7.4	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00	
19:59:14	7.4	-32.9	.00000	0.00000	0	0.00	0.	6	0.00	
19:59:29	7.4	-32.9	.00002	.00004	100	90.16	119.	280	.82	
19:59:44	7.4	-32.8	.00004	.00017	100	91.23	947.	350	.68	
19:59:59	7.4	-32.8	.00005	.00025	100	106.57	1044.	350	.94	
20:00:14	7.4	-32.8	.00003	.00005	100	89.51	350.	169	.79	

05 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
20:00:29	7.4	-32.7	.00002	.00003	88	90.98	163.	413	.53	
20:00:44	7.4	-32.8	.00000	.00001	100	33.34	415.	47	1.00	Bulk of cloud is off rt wing, banking to rt to get into it.
20:00:59	7.4	-32.6	.00001	.00003	100	89.07	87.	209	.99	
20:01:14	7.4	-32.7	.00000	0.00000	0	0.00	0.	6	0.00	
20:01:29	7.4	-32.5	.00003	.00001	86	43.02	198.	413	.32	
20:01:44	7.4	-32.8	.00005	.00020	96	100.41	853.	413	.57	Very thin.
20:01:59	7.4	-33.0	.00037	.00106	92	126.30	2078.	413	.71	Heavier cloud coming up. Contrail aloft.
20:02:14	7.4	-32.9	.00005	.00015	97	123.85	1340.	413	.38	
20:02:29	7.4	-33.0	.00013	.00038	96	131.77	669.	413	.74	
20:02:44	7.4	-32.9	.00010	.00057	99	115.75	1325.	413	.72	
20:02:59	7.4	-32.9	.00006	.00032	99	120.17	390.	413	.94	
20:03:14	7.4	-32.9	.00002	0.00000	0	181.22	3.	413	1.00	
20:03:29	7.5	-33.1	.00000	.00001	100	84.44	41.	189	1.00	Ci is the only cloud here. Can see rt 30 mi.
20:03:44	7.5	-33.6	.00000	0.00000	0	0.00	0.	14	0.00	
20:03:59	7.5	-33.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:04:14	7.5	-33.5	0.00000	0.00000	0	0.00	0.	0	0.00	Brownish cloud off left wing tip.
20:04:29	7.5	-33.5	.00000	0.00000	0	0.00	0.	18	0.00	
20:04:44	7.5	-33.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:04:59	7.6	-34.0	0.00000	0.00000	0	0.00	0.	0	0.00	
20:05:14	7.6	-34.0	0.00000	.00004	100	86.84	125.	209	.99	
20:05:29	7.6	-34.0	.00001	0.00000	0	0.00	0.	20	0.00	Just about at altitude of top of brown cloud to left.
20:05:44	7.6	-34.1	.00000	.00002	100	91.96	43.	209	1.00	
20:05:59	7.6	-34.3	.00002	.00003	100	72.86	180.	169	.98	
20:06:14	7.6	-34.2	0.00000	0.00000	0	0.00	0.	0	0.00	Very thin patches occasionally go by.
20:06:29	7.7	-34.4	0.00000	0.00000	0	0.00	0.	0	0.00	
20:06:44	7.7	-34.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:06:59	7.7	-34.5	.00000	.00002	100	61.98	165.	128	.93	To the left, the sky is bright blue; to the rt, higher Ci are
20:07:14	7.7	-34.3	0.00000	0.00000	0	0.00	0.	0	0.00	4000 to 5000 feet above us.
20:07:29	7.7	-34.2	0.00000	0.00000	0	0.00	0.	0	0.00	
20:07:44	7.7	-34.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:07:59	7.7	-34.1	.00001	0.00000	0	0.00	0.	26	0.00	
20:08:14	7.7	-34.1	.00000	0.00000	0	0.00	0.	16	0.00	
20:08:29	7.7	-34.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:08:44	7.7	-34.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:08:59	7.7	-34.2	.00001	.00003	100	99.14	121.	209	.82	
20:09:14	7.7	-34.1	0.00000	0.00000	0	0.00	0.	0	0.00	
20:09:29	7.6	-34.0	.00003	.00002	100	54.42	483.	108	.73	
20:09:44	7.7	-34.0	.00015	.00010	100	37.90	2807.	128	.88	
20:09:59	7.6	-33.9	.00044	.00065	100	63.68	9453.	230	.64	
20:10:14	7.6	-34.0	.00019	.00056	100	60.01	7848.	209	.76	
20:10:29	7.6	-34.2	.00007	.00012	100	70.39	874.	209	.84	We're on dividing line between cloudy air to rt and clr air to left
20:10:44	7.6	-34.2	.00044	.00096	100	60.50	12785.	311	.56	except for the brown long thin cloud.
20:10:59	7.6	-34.2	.00073	.00105	100	44.94	22476.	189	.84	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
20:11:14	7.6	-34.2	.00069	.00105	100	50.06	18878.	209	.78	
20:11:29	7.6	-34.2	.00033	.00045	100	48.23	9358.	250	.61	
20:11:44	7.6	-34.2	.00026	.00039	100	52.72	5516.	311	.47	
20:11:59	7.6	-33.7	.00007	.00010	100	54.72	1669.	148	.86	
20:12:14	7.6	-33.5	.00005	.00023	100	81.23	1763.	209	.76	
20:12:29	7.6	-33.8	.00002	.00011	100	82.92	546.	230	.79	
20:12:44	7.6	-33.8	.00011	.00028	100	92.35	978.	311	.67	
20:12:59	7.6	-33.8	.00000	.00013	100	126.75	913.	311	.42	
20:13:14	7.6	-33.9	.00008	.00014	100	66.79	823.	189	1.02	
20:13:29	7.6	-33.9	.00002	.00012	100	66.12	1356.	169	.79	
20:13:44	7.6	-33.8	.00002	.00006	100	50.61	967.	188	.95	
20:13:59	7.6	-33.7	.00009	.00016	100	49.61	3240.	148	.81	High Ci off rt., off left mostly blue sky. Ahead sunny, but a little hazy.
20:14:14	7.6	-33.6	.00006	.00002	100	50.07	149.	188	1.00	
20:14:29	7.6	-33.6	.00002	.00005	100	62.67	808.	148	.71	
20:14:44	7.6	-33.5	.00001	.00005	100	64.76	631.	189	.72	
20:14:59	7.5	-33.2	.00013	.00024	100	46.36	5276.	189	.74	
20:15:14	7.5	-32.8	.00006	.00015	99	58.79	1684.	413	.74	Very thin Ci here. Bright sun on ground, with just a little haze.
20:15:29	7.5	-32.5	.00003	.00016	100	56.37	2196.	189	.81	
20:15:44	7.5	-32.7	.00006	.00026	100	63.32	3219.	209	.74	
20:15:59	7.5	-32.7	.00018	.00042	100	76.05	2563.	250	.75	
20:16:14	7.5	-32.8	.00006	.00010	100	76.98	872.	189	.74	
20:16:29	7.5	-32.8	.00003	.00012	100	78.88	676.	209	.83	Brown band on left has flat top.
20:16:44	7.5	-32.7	.00017	.00032	100	68.61	2824.	230	.74	
20:16:59	7.5	-32.7	.00030	.00049	100	58.60	6193.	209	.77	
20:17:14	7.5	-32.7	.00026	.00053	100	50.61	8703.	209	.81	
20:17:29	7.5	-32.7	.00014	.00024	100	76.15	1884.	311	.49	
20:17:44	7.5	-32.6	.00007	.00015	100	66.20	1668.	230	.64	Very thin. Vis good in all directions, but haze everywhere. Higher Ci off our right but it stops overhead. Mostly blue sky out left, except for brown band.
20:17:59	7.5	-32.7	.00003	.00005	100	96.53	325.	230	.66	
20:18:14	7.5	-32.6	.00002	.00005	100	96.85	671.	230	.48	
20:18:29	7.5	-32.6	.00006	.00007	100	65.07	664.	189	.80	
20:18:44	7.5	-32.5	.00004	.00007	100	83.51	418.	209	.77	
20:18:59	7.5	-32.5	.00002	.00004	100	63.73	345.	148	.94	
20:19:14	7.5	-32.5	.00003	.00001	100	78.28	37.	169	1.00	
20:19:29	7.5	-32.5	.00001	.00005	100	66.97	313.	148	.99	
20:19:44	7.5	-32.5	.00002	.00002	100	68.75	100.	148	.99	Thick Ci on right. sunny to the left. A brownish layer casts a shadow on ground. Still sunny near airplane.
20:19:59	7.5	-32.6	.00001	.00003	100	73.64	159.	189	.98	
20:20:14	7.5	-32.7	.00001	.00002	100	75.49	92.	169	.96	
20:20:29	7.5	-32.6	.00000	.00002	100	75.49	92.	169	.96	
20:20:44	7.5	-32.5	.00000	.00002	100	61.87	131.	128	.99	
20:20:59	7.5	-32.4	0.00000	.00001	100	84.44	39.	189	1.00	
20:21:14	7.5	-32.3	.00000	.00004	100	86.75	119.	209	.98	
20:21:29	7.5	-32.4	.00000	.00001	100	50.53	111.	87	1.00	
20:21:44,	7.5	-32.4	.00000	0.00000	0	0.00	0.	14	0.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
20:21:59	7.5	-32.4	.00000	0.00000	0	0.00	0.	14	0.00	
20:22:14	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:22:29	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:22:44	7.5	-32.6	0.00000	0.00000	0	0.00	0.	0	0.00	
20:22:59	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:23:14	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:23:29	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:23:44	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:23:59	7.5	-32.5	.00000	0.00000	0	0.00	0.	4	0.00	
20:24:14	7.5	-32.5	.00000	0.00000	0	0.00	0.	4	0.00	
20:24:29	7.5	-32.3	.00000	0.00000	0	0.00	0.	4	0.00	Sun shines brightly through a higher Ci layer, but no halo.
20:24:44	7.5	-32.3	.00000	0.00000	0	0.00	0.	4	0.00	
20:24:59	7.5	-32.4	.00000	0.00000	0	0.00	0.	2	0.00	
20:25:14	7.5	-32.4	.00000	0.00000	0	0.00	0.	4	0.00	
20:25:29	7.5	-32.4	.00000	0.00000	0	0.00	0.	4	0.00	
20:25:44	7.5	-32.5	.00000	0.00000	0	0.00	0.	4	0.00	
20:25:59	7.5	-32.5	.00000	0.00000	0	0.00	0.	2	0.00	
20:26:14	7.5	-32.5	.00000	0.00000	0	0.00	0.	4	0.00	
20:26:29	7.5	-32.5	.00000	0.00000	0	0.00	0.	18	0.00	
20:26:44	7.5	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00	
20:26:59	7.5	-32.4	.00000	0.00000	0	0.00	0.	2	0.00	
20:27:14	7.5	-32.4	.00000	0.00000	0	0.00	0.	10	0.00	
20:27:29	7.5	-32.4	.00000	0.00000	0	0.00	0.	2	0.00	
20:27:44	7.5	-32.3	.00000	0.00000	0	0.00	0.	2	0.00	
20:27:59	7.5	-32.3	.00001	.00002	100	27.15	398.	47	1.88	On the right is a flat top of a Ci layer. Another Ci layer is above it.
20:28:14	7.5	-32.4	.00000	.00001	100	33.34	400.	47	1.00	Many Ci filaments going by below. We are 1000 feet above them.
20:28:29	7.5	-32.3	.00000	0.00000	0	0.00	0.	4	0.00	
20:28:44	7.5	-32.3	.00000	0.00000	0	0.00	0.	8	0.00	Can see reflection of sun on particles some distance below. A white spot
20:28:59	7.5	-32.2	.00000	0.00000	0	0.00	0.	6	0.00	below moves with the plane.
20:29:14	7.5	-32.3	.00001	0.00000	0	0.00	0.	22	0.00	
20:29:29	7.5	-32.3	0.00000	0.00000	0	0.00	0.	0	0.00	
20:29:44	7.5	-32.3	.00000	0.00000	0	0.00	0.	2	0.00	Fragments like strung out cotton going by 1000 feet above us.
20:29:59	7.5	-32.2	.00000	0.00000	0	0.00	0.	2	0.00	We may not get data from them. Looks dark ahead.
20:30:14	7.5	-32.2	.00000	0.00000	0	0.00	0.	4	0.00	
20:30:29	7.5	-32.3	.00000	0.00000	0	0.00	0.	4	0.00	
20:30:44	7.5	-32.2	.00000	0.00000	0	0.00	0.	4	0.00	
20:30:59	7.5	-32.2	.00000	0.00000	0	0.00	0.	2	0.00	Blue sky to left, Hi Ci to right filters sun.
20:31:14	7.5	-32.2	.00000	0.00000	0	0.00	0.	2	0.00	
20:31:29	7.5	-32.2	.00000	0.00000	0	0.00	0.	2	0.00	
20:31:44	7.5	-32.1	.00000	0.00000	0	0.00	0.	2	0.00	
20:31:59	7.5	-32.0	.00000	0.00000	0	0.00	0.	2	0.00	
20:32:14	7.5	-32.0	.00000	0.00000	0	0.00	0.	2	0.00	Can still see reflection of sun in thin stuff below.
20:32:29	7.5	-32.1	.00000	0.00000	0	0.00	0.	2	0.00	

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT M/M**3	LMAX UM	FF
20:32:44	7.5	-32.0	.00000	0.00000	0	0.00	0.	2	0.00
20:32:59	7.5	-32.0	.00000	0.00000	0	0.00	0.	2	0.00
20:33:14	7.5	-31.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:33:29	7.5	-31.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:33:44	7.5	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:33:59	7.5	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:34:14	7.5	-32.1	.00000	0.00000	0	0.00	0.	4	0.00
20:34:29	7.5	-32.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:34:44	7.5	-31.9	.00000	0.00000	0	0.00	0.	2	0.00
20:34:59	7.6	-31.8	.00000	0.00000	0	0.00	0.	2	0.00
20:35:14	7.6	-31.8	.00000	0.00000	0	0.00	0.	4	0.00
20:35:29	7.6	-31.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:44	7.6	-32.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:35:59	7.6	-32.2	.00000	0.00000	0	0.00	0.	4	0.00
20:36:14	7.7	-32.2	.00000	0.00000	0	0.00	0.	2	0.00
20:36:29	7.7	-32.4	.00000	0.00000	0	0.00	0.	2	0.00
20:36:44	7.7	-32.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:36:59	7.7	-32.7	.00000	0.00000	0	0.00	0.	4	0.00
20:37:14	7.8	-32.9	.00000	.00001	100	42.38	107.	67	1.00
20:37:29	7.8	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:37:44	7.8	-33.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:37:59	7.9	-32.9	.00000	0.00000	0	0.00	0.	2	0.00
20:38:14	7.9	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:29	7.9	-32.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:38:44	7.9	-33.1	.00000	0.00000	0	0.00	0.	2	0.00
20:38:59	7.9	-33.2	.00000	0.00000	0	0.00	0.	2	0.00
20:39:14	7.9	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:29	8.0	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:44	8.0	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:39:59	8.1	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:14	8.1	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:29	8.1	-33.2	.00000	0.00000	0	0.00	0.	4	0.00
20:40:44	8.1	-33.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:40:59	8.1	-33.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:41:14	8.2	-33.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:41:29	8.2	-33.5	.00000	0.00000	0	0.00	0.	2	0.00
20:41:44	8.2	-33.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:41:59	8.2	-33.6	.00000	.00003	100	69.55	358.	169	.79
20:42:14	8.2	-33.7	.00001	.00002	100	35.91	865.	128	.66
20:42:29	8.2	-33.8	.00003	.00009	100	45.47	2163.	128	.76
20:42:44	8.3	-34.0	.00005	.00005	100	54.70	963.	169	.72
20:42:59	8.3	-34.1	.00004	.00005	100	62.18	328.	169	1.10
20:43:14	8.3	-34.2	.00000	0.00000	0	0.00	0.	4	0.00

Ac or As below us tops out at 5000 feet below.

Ahead to the left there is a break between As and Ci, but hard to distinguish on right.

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF
20:43:29	8.3	-34.2	.00002	0.00000	0	0.00	0.	20	0.00
20:43:44	8.3	-34.2	.00001	.00014	100	85.21	758.	250	.71
20:43:59	8.3	-34.1	.00005	.00003	100	99.55	159.	230	.69
20:44:14	8.3	-34.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:29	8.4	-34.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:44:44	8.4	-34.2	.00000	0.00000	0	0.00	0.	8	0.00
20:44:59	8.4	-34.3	.00001	0.00000	0	0.00	0.	24	0.00
20:45:14	8.4	-34.4	0.00000	.00009	100	132.95	100.	311	.89
20:45:29	8.4	-34.4	.00001	0.00000	0	0.00	0.	26	0.00
20:45:44	8.4	-34.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:45:59	8.5	-34.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:14	8.5	-34.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:29	8.5	-34.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:44	8.5	-34.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:46:59	8.5	-35.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:14	8.5	-35.1	.00000	0.00000	0	0.00	0.	8	0.00
20:47:29	8.5	-35.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:44	8.6	-35.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:47:59	8.6	-35.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:14	8.6	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:29	8.6	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:44	8.6	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:48:59	8.6	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:14	8.6	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:29	8.7	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:44	8.6	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:49:59	8.7	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:14	8.7	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:29	8.7	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:44	8.7	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:50:59	8.7	-35.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:51:14	8.7	-35.4	0.00000	0.00000	0	0.00	0.	0	0.00
20:51:29	8.7	-35.4	0.00000	0.00000	0	0.00	0.	0	0.00
20:51:44	8.7	-35.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:51:59	8.7	-35.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:52:14	8.7	-35.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:52:29	8.7	-35.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:52:44	8.7	-35.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:52:59	8.7	-35.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:53:14	8.8	-36.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:53:29	8.8	-36.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:53:44	8.8	-36.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:53:59	8.8	-36.5	0.00000	0.00000	0	0.00	0.	0	0.00

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLR	DD UM	NT N/M**3	LMAX UM	FF
20:53:14	8.8	-36.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:54:29	8.8	-36.6	0.00000	0.00000	0	0.00	0.	0	0.00
20:54:44	8.9	-36.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:54:59	8.9	-36.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:55:14	8.9	-36.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:55:29	8.9	-36.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:55:44	8.9	-36.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:55:59	8.9	-37.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:56:14	8.9	-37.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:56:29	8.9	-37.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:56:44	8.9	-36.9	0.00000	0.00000	0	0.00	0.	0	0.00
20:56:59	8.9	-37.0	0.00000	0.00000	0	0.00	0.	0	0.00
20:57:14	8.9	-37.1	0.00000	0.00000	0	0.00	0.	0	0.00
20:57:29	9.0	-37.2	0.00000	0.00000	0	0.00	0.	0	0.00
20:57:44	9.0	-37.3	0.00000	0.00000	0	0.00	0.	0	0.00
20:57:59	9.0	-37.5	0.00000	0.00000	0	0.00	0.	0	0.00
20:58:14	9.0	-37.7	0.00000	0.00000	0	0.00	0.	0	0.00
20:58:29	9.0	-37.7	.00000	0.00000	0	0.00	0.	0	0.00
20:58:44	9.0	-37.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:58:59	9.0	-37.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:59:14	9.0	-37.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:59:29	9.0	-37.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:59:44	9.0	-37.8	0.00000	0.00000	0	0.00	0.	0	0.00
20:59:59	9.0	-37.9	0.00000	0.00000	0	0.00	0.	0	0.00
21:00:14	9.0	-38.0	0.00000	0.00000	0	0.00	0.	0	0.00
21:00:29	9.0	-38.0	0.00000	0.00000	0	0.00	0.	0	0.00
21:00:44	9.0	-38.0	.00000	0.00000	0	0.00	0.	6	0.00
21:00:59	9.0	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:01:14	9.0	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:01:29	9.0	-38.2	0.00000	0.00000	0	0.00	0.	0	0.00
21:01:44	9.0	-38.2	0.00000	0.00000	0	0.00	0.	0	0.00
21:01:59	9.0	-38.2	.00005	.00014	100	63.60	979.	169	1.01
21:02:14	9.0	-38.2	.00059	.00188	99	72.95	16878.	413	.63
21:02:29	9.0	-38.4	.00124	.00398	100	90.35	16737.	311	.67
21:02:44	9.0	-38.3	.00012	.00051	100	125.40	1320.	311	.66
21:02:59	9.0	-38.2	.00002	.00004	100	80.28	129.	289	.97
21:03:14	9.0	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:03:29	9.0	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:03:44	9.0	-38.1	0.00000	0.00000	0	0.00	0.	0	0.00
21:03:59	9.1	-38.1	.00003	.00007	100	88.29	874.	230	.51
21:04:14	9.1	-38.1	.00001	.00008	100	132.49	125.	311	.80
21:04:29	9.1	-38.1	.00008	.00032	100	83.17	1946.	230	.74
21:04:44	9.1	-38.0	.00020	.00077	100	102.11	3294.	311	.64

Still between As (top ~ 22,000') and Ci 2-3000 feet above us. We're in relatively cloud free air.

Ci filaments going by ~ 1000' above.

05 FEB 79 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT N/M**3	LMAX UM	FF	
21:04:59	9.1	-38.0	.00068	.00244	83	114.97	9159.	644	.54	
21:05:14	9.1	-38.0	.00137	.00589	98	114.00	17647.	413	.65	
21:05:29	9.0	-38.2	.00052	.00154	98	106.79	5664.	413	.61	
21:05:44	9.0	-38.1	.00045	.00178	99	110.39	6376.	413	.63	
21:05:59	9.0	-38.1	.00093	.00321	100	105.19	13119.	311	.61	Ci above us is nearly overcast, but is thin. Sun in cockpit. Grey sky,
21:06:14	9.0	-38.2	.00078	.00238	99	108.57	6995.	413	.69	the blue is hidden. Getting 2-D updates.
21:06:29	9.0	-38.2	.00032	.00140	100	111.21	3761.	311	.70	
21:06:44	9.0	-38.3	.00026	.00061	99	105.32	1426.	413	.77	
21:06:59	9.0	-38.3	.00013	.00034	100	118.65	916.	311	.68	
21:07:14	9.0	-38.4	.00014	.00092	99	114.91	2603.	413	.66	Vis is about 40 mi. As undercast; Ci overcast.
21:07:29	9.0	-38.3	.00082	.00264	99	108.84	8861.	413	.68	
21:07:44	9.0	-38.3	.00045	.00179	99	106.69	5073.	413	.71	
21:07:59	9.0	-38.4	.00003	.00011	100	131.85	174.	311	.79	
21:08:14	9.0	-38.4	.00001	.00009	100	132.51	99.	311	.91	
21:08:29	9.0	-38.4	.00022	.00092	100	95.48	3567.	311	.69	
21:08:44	9.0	-38.4	.00057	.00230	100	106.01	7001.	311	.69	Lot of Ci filaments going by above us.
21:08:59	9.0	-38.4	.00007	.00056	100	109.63	1573.	311	.69	Now into thin Ci.
21:09:14	9.0	-38.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:09:29	9.0	-38.4	.00004	.00033	100	108.02	1400.	311	.55	
21:09:44	9.0	-38.5	.00056	.00209	100	91.47	11957.	311	.67	Thinned out above us.
21:09:59	9.0	-38.5	.00149	.00564	100	102.63	20336.	311	.66	
21:10:14	9.0	-38.4	.00194	.00588	100	106.72	17367.	311	.69	
21:10:29	9.1	-38.6	.00107	.00349	99	103.11	9487.	413	.76	
21:10:44	9.1	-38.6	.00001	.00006	100	83.34	256.	209	.92	
21:10:59	9.1	-38.6	.00002	.00007	100	64.52	870.	169	.78	
21:11:14	9.1	-38.6	.00015	.00044	100	71.41	4025.	230	.70	
21:11:29	9.1	-38.7	.00010	.00023	100	80.20	1514.	230	.75	
21:11:44	9.1	-38.7	.00003	.00016	100	87.20	842.	230	.75	
21:11:59	9.1	-38.8	0.00000	0.00000	0	0.00	0.	0	0.00	Can see filaments floating by against blue sky.
21:12:14	9.1	-38.9	.00000	0.00000	0	0.00	0.	10	0.00	
21:12:29	9.1	-38.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:12:44	9.1	-38.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:12:59	9.1	-38.7	.00000	0.00000	0	0.00	0.	12	0.00	
21:13:14	9.1	-38.6	.00001	.00004	100	96.71	242.	230	.74	
21:13:29	9.1	-38.4	.00001	.00004	100	72.00	201.	169	.98	
21:13:44	9.1	-38.4	.00002	.00001	100	61.99	216.	128	.82	
21:13:59	9.1	-38.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:14:14	9.1	-38.3	.00010	.00013	100	55.09	2210.	169	.81	
21:14:29	9.1	-38.4	.00022	.00037	100	52.24	6230.	169	.84	
21:14:44	9.1	-38.3	.00013	.00016	100	52.64	3202.	169	.74	
21:14:59	9.1	-38.4	.00017	.00022	100	44.44	4494.	109	.81	
21:15:14	9.1	-38.5	.00028	.00036	99	52.57	6201.	413	.78	
21:15:29	9.1	-38.4	.00004	.00011	100	39.91	1132.	148	.94	

05 FEB 79 — 15 SECOND AVERAGE

START TIME	ALT KM	TEMP C	LWC-SC G/M**3	LWC-CP G/M**3	LWC CLD	DD UM	NT M/M**3	LMAX UM	FF	
21:15:44	9.2	-38.5	.00000	0.00000	0	0.00	0.	0	0.00	
21:15:59	9.2	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:16:14	9.2	-38.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:16:29	9.2	-38.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:16:44	9.2	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:16:59	9.2	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	Flying over almost complete Ac undercast, but soon it will disappear
21:17:14	9.2	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	to reveal the ground. Ac extends E-W.
21:17:29	9.2	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:17:44	9.2	-38.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:17:59	9.2	-38.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:18:14	9.2	-38.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:18:29	9.1	-38.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:18:44	9.0	-37.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:18:59	9.0	-36.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:19:14	8.9	-36.4	0.00000	0.00000	0	0.00	0.	0	0.00	Have passed over E-W cloud line. Can see the ground everwhere now.
21:19:29	8.8	-35.8	0.00000	0.00000	0	0.00	0.	0	0.00	
21:19:44	8.8	-35.2	0.00000	0.00000	0	0.00	0.	0	0.00	Beginning to descend.
21:19:59	8.8	-35.0	0.00000	0.00000	0	0.00	0.	0	0.00	
21:20:14	8.7	-34.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:20:29	8.6	-34.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:20:44	8.4	-34.2	0.00000	0.00000	0	0.00	0.	0	0.00	
21:20:59	8.3	-33.9	0.00000	.00000	100	58.07	40.	100	1.00	Can see shadow from contrail that goes out in straight line away.
21:21:14	8.1	-33.9	0.00000	0.00000	0	0.00	0.	0	0.00	
21:21:29	7.9	-34.1	0.00000	.00001	100	54.52	116.	100	.98	
21:21:44	7.7	-33.9	0.00000	0.00000	0	275.70	0.	644	.92	
21:21:59	7.6	-33.2	0.00000	.00000	100	42.38	113.	67	1.00	
21:22:14	7.5	-32.2	0.00000	.00000	100	58.07	46.	100	1.00	
21:22:29	7.4	-31.4	0.00000	0.00000	0	0.00	0.	0	0.00	
21:22:44	7.3	-30.9	0.00000	.00001	100	58.07	219.	128	.87	
21:22:59	7.3	-30.5	.00007	0.00000	0	0.00	0.	24	0.00	
21:23:14	7.2	-30.5	0.00000	.00001	100	46.66	190.	87	.97	A couple of Ci fragments going by.
21:23:29	7.2	-30.0	0.00000	.00002	100	54.53	241.	100	.98	
21:23:44	7.1	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:23:59	7.1	-29.5	0.00000	.00001	100	58.07	50.	100	1.00	
21:24:14	7.1	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:24:29	7.1	-29.7	0.00000	0.00000	0	0.00	0.	0	0.00	
21:24:44	7.1	-29.6	.00009	0.00000	0	0.00	0.	16	0.00	
21:24:59	7.1	-29.7	.00009	.00037	99	101.36	1200.	413	.71	
21:25:14	7.1	-29.6	.00038	.00132	99	105.68	6452.	413	.56	
21:25:29	7.1	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:25:44	7.1	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	
21:25:59	7.1	-29.6	0.00000	0.00000	0	0.00	0.	0	0.00	
21:26:14	7.1	-29.5	0.00000	0.00000	0	0.00	0.	0	0.00	

Appendix D

List of Abbreviations

Ac	Altocumulus
AFB	Air Force Base
AFGL	Air Force Geophysics Laboratory
AFWL	Air Force Weapons Laboratory
Alt	*Altitude (above mean sea* level unless otherwise specified)
ART	Airborne Radiation Technology
ASSP	Axial Scattering Spectrometer Probe
AS	Altostratus
C	Cloud (or droplet) Probe
^{o}C	Temperature in degrees Celsius
Cc	Cirrocumulus
Ci	Cirrus
Cs	Cirrostratus
Do	Median Volume Diameter
FF	Form factor
GOES	Geostationary Operational Environmental Satellite
$G\text{-}m^{-3}$	Grams per cubic meter
Hdg	Aircraft Heading
IAS	Indicated Airspeed
IWC	Ice Water Content
KABQ	Albuquerque, N.M.

KELP	El Paso, Texas
km	kilometer
LWC	Liquid Water Content
L_{max}	Maximum Particle Diameter
m	meter
mbar	millibar
μm	micron (=10^{-6} m)
mm	millimeter (=10^{-3} m)
MSL	Mean Sea Level
MST	Mountain Standard Time
NT	Particle Density
1-D	One-Dimensional Particle Measuring System
P	Precipitation probe
T	temperature
TAS	True Air Speed
2-D	Two-Dimensional Particle Measuring System
vis	visibility
UMT or Z	Universal (or Greenwich) Mean Time
Z	Calculated Radar Reflectivity
~	Approximately

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DTIC